Executive Summary

1.1 Introduction

Taking the notice of slow growth in agriculture and allied sectors, National Development Council (NDC) reaffirmed its commitment to rejuvenate agriculture by achieving 4 per cent annual growth rate during the Eleventh five year plan. The council made agriculture growth as an essential element of its strategy to make growth more inclusive and passed a resolution to actualize the envisaged growth rate. Meanwhile, the Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India, in compliance with NDC resolution and in consultation with the Planning Commission, formulated guidelines for Rashtriya Krishi Vikas Yojana (RKVY). As per these guidelines, each district is required to formulate a Comprehensive District Agriculture Plan (C-DAP) by including the resources from both the centrally sponsored and state sponsored existing schemes.

The Comprehensive District Agricultural Plan (C-DAP) aims at moving towards projecting the requirements for development of agriculture and allied sectors in the district. Therefore, C-DAP is not only the usual aggregation of the existing schemes but it would present the vision for development of agriculture and allied sectors within the overall perspective of the district.

The C-DAP would present the financial requirements and sources of finance for agriculture development in a comprehensive way. It would also include animal husbandry, fishery, dairy, minor irrigation, agriculture marketing, forestry, water harvesting and conservation of natural resources, keeping in view the technological possibilities in the district.

The C-DAP of district Una has been prepared as per the guidelines of RKVY. This plan document analyses the current situation of agriculture and allied sectors in the district Una and also describes the needs and potentials along with statement of objectives and analysis of ongoing as well as new schemes and programmes. The District Plan discusses what the district will try to achieve over a medium term of five years and how it intends to achieve it. The C-DAP also contains an action plan along with tentative financial outlay with a provision of continuous updating.

Objectives

The aim of C-DAP is to design an integrated and participatory action plan for the development of agriculture and allied sectors within the purview of overall development of local areas. The basic grassroots level data have been collected to fulfill the aim of the district plan. The objectives of district plan are;

- to prepare a C-DAP under participatory approach involving various departments, organizations and stakeholders;
- to assess and plan for the infrastructure required for the development of agriculture;
- to identify the enabling factors for optimal utilization of scarce natural, physical and financial resources;
- to strengthen linkages with required institutional support services like credit, technology transfer, research and extension; and
- to evolve an action plan for achieving sustainable agricultural growth with food security, growth oriented cropping system and development of allied sectors that will improve income of the farmers.

District Profile

Una has been one of the smaller districts of Himachal Pradesh, which is located in the western part of the state along its boundary with Punjab. Prior to reorganization of Punjab in 1966, Una district was part of Hoshiarpur district of Punjab. At present it is bounded by district Kangra in the north, districts of Hamirpur and Bilaspur in the east, district Roopnagar of Punjab in the southeast, and districts of Hoshiarpur and Nawanshahr of Punjab in the west. The latitudinal and longitudinal extent of the district is from 31°-17′-52″ to 31°-52′- 0″ north and 75°-58′- 02″ to 76°-28′-25″ east respectively. The total geographical area of the district is 1540 sq. km which is about 2.8 % of the total area of the state. About two thirds of the district has an elevation between 300-600 metres and the remaining about one third between 600-900 metres from the sea level. A few ridge tops and peaks also have elevation more than 900 metres. River Soan and the northwestern part of Govind Sagar (from Bhakra Dam to the northwestern end of the reservoir) are the most prominent water features of the district.

The district has been divided into four tehsils (Una, Amb, Haroli and Bangana) and one sub-tehsil (Bharwain). Under community development programme, the district has been divided into five community development blocks namely Una, Amb, Gagret, Bangana and Haroli. The total number of inhabited villages in the district is 758 and the district has 5 towns. More than 90 per cent of district's population lives in villages and mainly depends on agriculture as a main occupation. As per Census 2001, the district has a population of 4,48,273 persons, having 997 females against 1000 males, the density of population is 291 persons per sq km, the percentage of SCs in total population is 22.4 and the STs population is negligible in the district. Out of total population, 4, 08,849 (90 per cent) persons are living in 758 villages and the remainig population of 39424 persons is living in 5 urban towns. More than 64 per cent (488) of villages in the district have population less than 500 and only 4.1 per cent (31) villages have population more than 2000. The literacy rate, including 0-6 years of population, in the district is 69.7 per cent (male 69.4 per cent

and female 64.3 per cent).The literacy rate in the rural areas is 69.4 per cent (male 75 %, female 63.9 %). Almost 92 per cent of population of the district belongs to Hindu, 5.2 per cent Sikhs, and 2.6 per cent to Muslim religions. The district has a good network of education and health institutions. There were 505 primary, 118 middles, and 128 senior secondary and 7 colleges in 2006-07, in which respective number of students were 34540, 7528, 44328, and 6085 respectively.

All villages in the district are electrified. On manufacturing side, the district had 96 registered factories with 849 workers during 2007-08. So far the financial institutions are concerned, the district has 53 branches of commercial banks, 22 of co-operative banks, 4 of agriculture development banks and 3 of rural regional banks with total deposits of Rs 1191 crore, Rs 490.09 crore, nil and Rs 17.58 crores respectively. The total advances were Rs 337.48 crores, Rs 116.72 crores, Rs 12.08 crores and Rs 6.96 crore respectively in 2007-08. The corresponding Credit Deposit (CD) ratios were 31.7 per cent, 23.8 per cent, nil and 39.6 per cent respectively. There are 219 Primary Agricultural Co-operative Societies (PACSs), with 181491 membership, Rs 1205.9 lacs as share capital, and Rs 27776.11 lacs as working capital, during 2006-07. The roads network in the district shows that it has almost 1700 kms road length both double and single. As far about records of employment office, there are almost 57621 unemployeds in the district, out of them 88 per cent have education upto the matric and above. The health facilities are provided through 1 regional hospital, 1 civil hospital, 15 community health centres, 19 primary health centres, 134 sub centres, 1 ESI dispensary, 2 ayurvedic hospitals, 69 ISM ayurvedic centres and 1 naturopathy clinic.

Agriculturaly, the total net sown area in the district is around 37 thousand hec. which is about 24 per cent of the total geographical area of the district. Wheat and maize are the main crops of the district during rabi and kharif which account for 45.8 % and 42.9 % of the total cropped area respectively. The cropping intensity in the district is 193 %. The district has a good scope for the promotion of horticulture. The area under different fruit crops was 5256 hectares in 2006-07 and the total production was 5750 MTs. The gross irrigated area in the district is 13588 hectares, which is about 37 % per cent of the total cropped area (71,469 hects) of the district. The forests cover is only 12 per cent of the total area. As per livestock census 2003, the district has 204542 animals and 96764 poultry birds. There are 18 veterinary hospitals and 110 veterinary dispensaries to provide better veterinary facilities to the animals. The district produced 1,03,563 litre milk, 54,74,463 eggs and 604 MTs fish during 2006-07. The total registered tractors in Una were 127 in 2006-07, but the actual numbers of tractor in the district are much larger (1665 in 2008).

The entire district of Una falls in Shivalik Hills region. The district may be divided into two physiographical parts: (i) Irrigated Plain Valley Tract; and (ii) Rainfed Hilly Tract.

For adopting appropriate strategies to accelerate the process of agricultural development, the Agricultural Technology Management Agency (ATMA), Una district has been divided into following four Agro-Ecological Situations (AESs) on the basis of soil type, topography and irrigation patterns:

AES-I (Swan Bella) includes the plain areas of the district
AES-II (Swan- Har) spreads throughout the all five blocks of the district
AES-III (Beet Area) mainly spreads over Haroli block
AES-IV (Mid Hills) spreads over the parts of Bangana, Amb and Gagret and Una blocks

1.2 Main points of the SWOT

Strengths

- The soils of the district are suitable for growing food crops, cash crops, vegetables and fruit plants.
- Except for some period during winter temperature in the district are conducive for seed germination and plant growth.
- The district receives a fairly good quantum of precipitation i.e. between 1000-1400 mm per annum.
- The cropping intensity of 193 per cent is better than the state average of 176.
- The soil testing facilities are available in the district.
- Hybrid seeds of most crops are available locally.
- The percentage of irrigated cultivation is more than the state average
- The district has a fairly good availability of Farm Yard Manure, Biomass and Animal Dung.
- The cows and buffaloes are in plenty and milk collection centres are also available.
- Availability of green fodder almost throughout the year is a favourable factor for the development of dairy sector.
- The topographical variations and altitudinal differences coupled with well drained soils favour the cultivation of temperate to sub-tropical fruits like kinnow, pear mango, citrus, etc.
- The region is also suitable for cultivation of other horticultural produce like flowers, mushroom, honey and hops.
- Fishery and sericulture are also practiced in the district.
- The technical support for the promotion of agriculture and allied sectors is available from the concerned departments, institutions, Agricultural University and Krishi Vigyan Kendra.
- A good network of co-operative and banking institutions for providing agri-credit is available.
- The district is famous for the quality production of jaggery and potato and the farmers are aware about it.

- Khair a high value commercial plant is in abundance in the district and local timbers are available for fuel.
- People of the district have keen interest in the adoption of new technologies.
- Good network of health and educational institutions is strengthing the development of social sectors; and
- The high literacy rate among both male and female is a favourable factor

Weaknesses

- Because of undulating topography and coarse texture of soils, the problem of soil erasion in the district is very severe.
- Apart from soil erosion, gully erosion, rill erosion, water logging, perennial weeds and alkalinity/salinity/acidity are some of the other serious problems of the area.
- Most soils in the district have low water holding capacity.
- The net sown area accounts for only 24 % of the geographical area of the district.
- Virtually mono-cropping sequence that is maize-wheat rotation is practiced which is harmfull for the soil health.
- Undulating topography, shallow to medium soil depth, steep slopes, coarse textured poor soil structure and relatively scanty vegetative cover are the constraints for the crop productivity in Rainfed Hilly tract
- Some period during winter particularly when the night temperatures fall below 4°C, is not conducive for the germination of seeds and growth of plants
- Fog and frost are common in some parts of the district during winter.
- Severe infestation of lantana and parthenium plants/grasses in forest/grasslands
- Infestation of ageratum in arable and non-arable lands
- Deforestation due to regular cutting of forest trees
- Only 23 % of the net sown area has the irrigation facility
- Artificial Insemination among cows and buffaloes is not as popular as it should be
- Lack of quality planting material for gardening
- Lack of modern production technologies and facilities
- Lack of rapid and efficient transfer of technology
- Poor accessibility in hilly areas.
- Lack of post-harvest management technologies
- Losses due to vagaries of nature are high
- Low pace of development in agro processing and handicraft activities
- Inadequate marketing infrastructure and intelligence; and
- Many roads require repair or upgradation
- Mechanisation of farming operations is low

Opportunities

- Well drained soils in most of the district permit the cultivation of most crops, vegetables and fruit trees.
- Ample scope for water harvesting in the district.
- Scope for diversification and intensification of agriculture by growing vegetables, fruits and medicinal plants after improving fertility.
- Scope of cultivation of vegetables in polyhouses, green houses, under shade nets and low plastic tunnels.
- The district holds good potential for the cultivation of coffee seeds.
- Scope for enhancing farm mechanization new agriculture machinery like laser land leveler, happy seeder, rotavator, zero till drill, potato digger, horticulture machinery etc can be popularized among the farmers through cooperative societies
- Scope for expanding and upgradation of agricultural markets in the district.
- Repair and upgradation of existing roads and construction of new link roads can contribute significantly to the over all development in the district.
- Role of cooperatives for enhancing agricultural loans and in providing other facilities to the farmers can be improved
- Seed replacement in a cycle of 3-4 years and seed treatment every year can enhance the productivity of wheat, maize and paddy.
- Production of certified seeds can be enhanced in the district.
- Use of herbisides can be popularised.
- A large number of water bodies in the form of village ponds, check dams and reservoirs hold good promise for fisheries.
- Bee keeping and mushroom cultivation can provide employment opportunities to educated and semi educated unemployed youth, women and landless, marginal and small farmers
- Use of vermi compost and farm yard manure can be popularized.
- The district has good scope for bringing more area under ginger, turmeric and other spices, aromatic and medicinal plants.
- There is good scope for promoting organic farming.
- Commercial dairy farming can be promoted and popularized
- Milk chilling centres can be promoted
- Good scope for planting improved varieties of grasses for fodder
- More area can be brought under sugarcane cultivation
- Processing units for katha making can be increased
- As the literacy in the district is high, therefore, there is a big scope for human resource development for adopting modern technologies in the areas of agriculture, village &cottage industry and handicrafts in the district
- Scope for preservation of indigenous breeds of animals

- Scope for convergence of NREGS, Bharat Nirman, PMRY, RKVY and other schemes for the development of agriculture
- Scope for promotion of IPM and INM practices through demonstrations and trainings
- Scope for strengthening of milk co-operatives
- District has a big scope for the promotion of handicrafts through women SHGs.
- Agri-tourism can be introduced, popularized and promoted for national and international tourists

Threats

- Too much dependence on rainfall is the most serious threat for the agriculture of the district
- Excessive soil eroision
- High infestation of Lantana and Parthenium weeds has emerged as a major problem
- Frequent cutting of forests is causing ecological and environmental threats
- Forest fires have a negative impact on the economy and ecology
- Attack of fruit fly damaging fruit production
- Monkeys, other wild animals and stray cattle menace for agriculture, forestry and horticulture
- Crop diseases like Karnal bunt and others
- Setting up of developmental projects, industrialization and urban expansion in the district are likely to encroach some of the cultivated land
- Non application of micro nutrients, farm yard manure, green manure, vermi compost etc and indiscriminate use of chemical fertilizers can reduce the soil fertility
- High rate of infertility in cows have created a very serious problem of stray cattle in the district
- Crop failure due to natural or man made calamities or unremunerative prices for the produce can result in heavy economic loss to the farmers.
- Youth is not showing keen interest in agriculture

1.3 Areas / Sectors which needs to be addressed in district

Engaging two thirds of the work force and contributing about one-fourth of the net state domestic product, the agriculture is the staple economy of the state as well as of Una district. Almost two thirds of the landholdings are smaller than one hectare.A shift of the agricultural workforce to non-farm employment is essential for reducing the pressure on agriculture. In agricultural sector, the crux of the matter lies primarily in raising agricultural productivity and adding value to agricultural produce through necessary processing. This is necessary through improving soil health, development of land, extension of irrigation, increase in area under high yielding varieties of major crops, and

an accelerated shift from grain crops to horticulture; and forward linkage of horticulture with industry. The district can hope to realize rich revenue through cultivation of medicinal and aromatic plants. The scope for organic farming is immence as the use of fertilizers and pesticides is already low in the district, as well as in the state as compare to neighboring states of Punjab and Haryana. There is a need of a package approach consisting of drip and sprinkler irrigation, appropriate technology, improved road transport, better marketing infrastructure and extension services. The promotion of livestock sub-sector is both a need and relief for the district. The primary task is to upgrade the quality and raise the productivity of the livestock. Veterinary sector is one which offers great employment opportunities, both direct and indirect. The district forests are a wealth whose value lies primarily in preserving rather than utilizing these for ensuring ecological well being of the people.

The forests of the district have thousands of plant species. This represents the degree of bio-diversity which district enjoys. Quite worrisome is the estimated survival rate of saplings, forest fires, deforestation and infestation of lantana plants. 'Sanjhi Van Yojna' has to be made more effective for meeting the situation. Road construction inevitably depletes some forest cover. To minimize such damage, it is desirable to construct roads passing through protected forest under the supervision of the forest department.

'Watershed Development' strategy has demonstrated itself as the most effective for the promotion of forestry. This needs to be adopted in all cases.

Besides, the co-operatives and banks, the micro credit may become a successful programme to realize the social agenda of the banking sector in the overall development of rural areas. Here, the role of PRIs, Co-operatives and NGOs can be acknowledged as catalysts. These bodies can stand for guarantee employment both farm and non-farm sectors.

It is commendable that, over the years, as per the state policy approach, the district has consistenly followed a sensible policy of locating service institutions, such as schools, dispensaries, veterinary centres, regulated agricultural markets, co-operatives and fair price shops, at appropriated places/panchayat headquarters. This has led to a fairly equitable distribution of such basic services for the rural masses. As a result the human development index of the district gained a pride in the state.

This is not to say that all is well on the rural front, the issue of ensuring quality of services, better all weather roads, sustainable supply of safe drinking water, connectivity still remains to be addressed. The scene may change with devolution of functions, finances and functionaries to the panchayats in real sense. It is most essential that the elected

representatives are made aware about their obligations and are trained for the functions to be performed by them. This would be in the nature of capacity building of those who are to manage development at grassroot levels.

The time has come when education as a sector has to be reinvented for adressing job opportunities that may emerge as a consequence of the growth of other sectors, such as industry, information technology, tourism and horticulture. There is need to shift its thrust from formal learning to technical and professional training.

In the field of health, the government will have to continue playing a big role in the provision of health services. The public health delivery system has followed a sensible policy of locating the health services at the panchayat level, by and large. However, some panchayats still remain without this facility, a gap which needs to be filled on priority basis.

The private sector can also be encouraged to come into diagnostic services, including with in the premises of government hospitals and dispensaries.

By rendering road connectivity to every village, the efforts should be geared towards bringing the produce from remote areas to convenient transit points on the main routes. A well designed multi-model scheme, combining ropeways/pathways, road and rail transports can effectively serve both economy and people of the district.

Data show that the tertiary sector activities of transport, hotel/restaurant and financial services and secondary sector activities of construction, manufacturing and agro-processing are growing fastly in the district. The message is clear; the industry, transport, tourism and repair and maintenance services hold the key to generation of additional employment in the district. Since employment elasticity of economic growth is not much obliging, it is critical to promote enterprenuership and create climate for self employment among youth who other wise look only for government job as ultimate-in-life.

It is indeed the quality of governance, which determines the functional quality and development dynamics of any system. Therefore, the governance should always be efficient, just and effective. It must be oriented to technology, knowledge and development.

Information Technology (IT) is an integral part of the future development process, especially for rural development focusing on the development of agriculture and allied sectors. Information Technology has a facilitative role to play in providing information about the rural development programmes, development problems and prospectives. All

components of rural development viz. agriculture and allied sectors development, infrastructure development, human resource development, rural industrialization and grassroots level rural governance can directly or indirectly benefit from Information Technology by focusing attention on improvement of production, consumption and social services. Computerized information can be used in decision making at village, block and district levels for maintaining land records, forestation, beneficiaries' details, development schemes, co-operatives, banking, and employment and for other socio-economoc indicators. It has become necessary to make Information Technology as a part of planning.

1.4 Various On-going programmes- a brief contextual gist

The following centrally/state sponsored programmes/schemes for development of agricultural and allied sectors are on-going in the district.

Agriculture Programmes/Schemes

- C.S. 67/A (P) 16.17 Centrally Sponsored Macro Management Work Plan Agri (90:10). Under this scheme, funds are provided for various types of activities in the ratio of 90:10 by the Government of India and the State government respectively. The district received funds for;
    - Improvement of soil health; and
    - Reclamation of alkali soil
- C.S. 71/A(P) 16.39 ISOPOM

  The funding pattern of the scheme is 75:25 (Government of India: State). Although the main objective of the scheme is to increase the production of oil seeds, pulses and maize, yet its contribution in the improvement of soil health through crop diversification is no less significant. The scheme also has a provision for providing assistance for the distribution of gypsum/pyrite/liming/dolomite and micronutrients needed for the improvement of soil health.
- The **National Horticulture Mission** also provides assistance for setting up a vermi compost unit for fruit and vegetable growers.

Fertilizer, as an input, helps in increasing the production and improving the soil to a great extent. Since, fifties the fertilizer use is constantly increasing in the state. The consumption level, which was 23664 tonnes in 1985-86, increased to 48,981 tonnes in 2006-07. The state government provides 100 per cent subsidy on transport of all kind of fertilizers to retail sale points for bringing the uniform sale rates in the state. The government is giving subsidy @ Rs 200 per MT on the cast of CAN, UREA and Ammonium Sulphate and @ Rs 500 per MT on NPK (12:32:16) and NPK (15:15:15)

Multiplication and Distribution of Seeds, Manure and Fertilizers, Crop Insurance, Plant Protection, Commercial Crops, Extension and Farmers Training, Agricultural Engineering, Supplementation/complementation of State efforts through work plan under macro-management approach for Agriculture Development and Integrated Scheme of Oilseeds, Pulses, Palmoil and Maize (ISOPOM)

Horticulture Schemes

Horticulture Technology Mission/National Horticulture Mission

The scheme focuses on Plant Nutrition, Plant Protection, Horticulture Development, Development of Bee-Keeping, Development of Floriculture, Development of Mushroom,

Horticulture Economics and Statistics, Fruit Processing and Utilization, Horticulture Training and Extension, Establishment/Maintenance of Govt.Orchards/Nurseries, Macro Management of Horticulture, Marketing and Quality Control and Horticultural Research and Education

Soil Conservation Schemes

Better management and optimum utility of land by carrying out soil survey to classify land according to its capability, Soil conservation work like bench terracing, leveling of land and contour strips etc, Integrated development of selected watersheds, land development in the catchment areas of rivers, Soil and water conservation measures in catchment of flood prone rivers and Soil and Water conservation measures on agriculture land with special emphasis on land belonging to small and marginal farmers, SCs/STs/IRDP families, Measures both on community and individual basis

Animal Husbandry Schemes

Veterinary Services and Animal Health, Cattle and Buffalo Development, Poultry Development, Sheep and Wool Development, Other Livestock Development like Horse Breeding Programme and Angora Rabbit Programme, Feed and Fodder Development and Assistance to State for Control of Animal Disease (ASCAD)

Fisheries Schemes

Conservation of Reservoir Fisheries, Production of Carp Seed, Production of Trout Seed, Trout Farming Project, Management and Development of Carp Farm, Assistance to Fish Farmers Development Agency, Extension and Training and Accident Insurance Scheme for Fishermen

Forestry Schemes

Forest Research and training, Development of Pastures and Grazing lands and their Improvement, Improvement of Tree Cover; (i) Afforestation Scheme; (ii) Enrichment Planting; and (iii) Re-afforestation of Scrub Areas, Raising Nurseries for Departmental Planting and Public Distribution, World Bank Aided Integrated Watershed Development Project (Kandi Area), New Forestry (Sanjhi Van Yojana), Communication, Buildings, Wildlife Preservation and Intensive Management of Wildlife Sanctuaries (50:50).

Co-operative Schemes

Credit Co-operatives, Marketing Societies, Fisherman Co-operatives and Industrial Co-operatives

1.5 District Plan at a Glance

Table-1.1
Total Five Year Perspective Budgetary Plans for Una district (In lakhs)

S. No.	Works	Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
1.	Land Development Activities	168.7	138.7	138.7	138.7	138.7	723.5
2.	Minor Irrigation	490.7	490.7	490.7	490.7	490.7	2453.5
3.	Crop Seeds	69.0	69.0	69.0	69.0	69.0	345.0
4.	Horticulture	552.6	465.1	465.1	465.1	465.1	2413.0
5.	Integrated Pest Management	38.8	38.8	38.8	38.8	38.8	194.0
6.	Social Forestry/Farm Forestry	50.0	50.0	50.0	50.0	50.0	250.0
7.	Sericulture Development	10.0	10.0	10.0	10.0	10.0	50.0
8.	Dairy Development	856.5	815.8	815.8	815.8	815.8	4119.7
9.	Piggeries	2.0	2.0	2.0	2.0	2.0	10.0
10.	Poultry	17.5	17.5	17.5	17.5	17.5	87.5
11.	Fishery/Bee Keeping/Rabbitory	58.6	58.6	58.6	58.6	58.6	293.0
12.	Farm machinery to Co-operative Societies (subsidy @ 50 per cent)	45.4	45.4	45.4	45.4	45.4	227.0
13.	Markets & Cold storage	63.8	63.8	60.0	60.0	60.0	307.6
14.	Renewable sources of energy and waste utilization	4.0	4.0	4.0	4.0	4.0	20.0
15.	Agro and Food Processing Industry	26.2	26.2	26.2	26.2	26.2	131.0
16.	Training and Mass Campaign on Agriculture and allied sectors	50.0	50.0	50.0	50.0	50.0	250.0
17.	Rural Based Non-farm Activities	37.5	37.5	37.5	37.5	37.5	187.5
18.	Agri Tourism	58.0	58.0	58.0	58.0	58.0	290.0
	Total	**2599.3**	**2440.1**	**2437.3**	**2437.3**	**2437.3**	**12352.3**

1.6 Public-Private partnerships that can be envisaged in the proposed plan

The liberalization policy approach has been adopted by government of India and the state governments since ninties and new strategies are being implemented to promote the agriculture and allied sectors by adopting public-private partnership in the areas of crop sector, horticulture, agro-food processing and other sub sectors, which are directly or indirectly related to agriculture. Initiatives have been taken by the corporate sector to promote supportive infrastructure for the development of agriculture and allied sectors through credit linked programmes, capital investment, subsidy schemes, schemes for development and strengthening of agri market infrastructure and standardization. More and more investment through Public-Private initiatives needs to be roped up as it opens new avenues for the development of this sector.

1.7 Expected outcomes as a result of implementation of the Plan

As the result of implementation of the plan proposals, the following major outcomes are expected by the end of the present plan in 2012.

- Marked increase in productivity and production of wheat, maize, paddy, oilseeds, potato and vegetables is expected.
- It is expected that the average yield of wheat in the district by 2012 will be in the range of 2200-2400 kg/hects as compared to 2000-2100 kg/hects in 2004-05. In other terms, more than 10 per cent increase can be expected in the average yield of

wheat. This increase will be largely due to the adoption of seed replacement practices.

- Similarly 40-50 per cent increase is expected in the yield of paddy. The average yield of paddy crop is around 1500 kg/hects. It will be above 2500 kg/hects by 2012. In case of paddy, another important change is expected, that is, the local course grain paddy may be replaced by super fine grain paddy. Productivity improvement between 20-30 per cent is expected in case of maize.
- The average yield of maize was around 1700-1800 kg/hects in 2004-2005. It is expected that it may increase to 2100-2500 kg/hects by 2012.
- Only marginal increase of about 7-10 per cent can be expected in the yield of wheat. Only a major break through in seed development tehnology can bring significiant changes in the productivity of wheat.
- Productivity of pulses and oilseeds will increase to 600-700 kg/hects as compared to 450-500 kg/hects in 2004-05.
- About 40-50 per cent increase in the productivity of potato and vegetables is expected from the present levels of 136 qtls/hects for potato and 165 qtls/hects for vegetables.
- It is expected that the diversification process in agriculture will take place speedly.
- A sizeable area covered by maize and wheat crops will shift towards paddy, pulses, oilseeds, potato, vegetables, sugarcane, medicinal and aromatic plants etc. About 20-30 per cent increase in area under these crops is expected.
- More area will come under High Yielding Varieties.
- As a result of crops diversification, improvement in irrigation facilities, improvements in rainfed cultivation, adoption of modern technologies, etc; the crop intensity will increase further from the present level of 193 per cent.
- Use of IPM and INM, water use efficiency techniques, organic farming, farm mechanization, post harvest technologies will be helpful in improving quality and quantity of farm produce.
- The area under fruit cultivation which was about 5000 hects in 2006-07 is likely to increase to 6000 hects or more by 2012.
- The increase in orchard area will be mainly in mango, citrus fruits, lichi etc.
- The diversification is expected towards Pomegranate, Aonla etc.
- More area will come under improved varieties of Mango and citrus fruits are likely to be in adoption.
- Protected cultivation of vegetables under green houses, shade net houses, plastic tunnels is likely to become popular.
- Micro irrigation schemes, use of farm mechanization, post harvest technology will become more popular.
- Ground water recharging, development of ponds for water recharging, safe disposal field structures, channelisation of koohls, more use of farm tanks, micro/drip

irrigation, use of tensiometres etc. will become more popular as efficient water saving/using techniques.

- The department of Animal Husbandry is confident to achieve expected target growth in milk, meat and egg production. Good concentrate feed in full quantity and of good quality will boost the productivity of the animal.
- Goats and sheep rearing will get a boost.
- It is expected that by 2012, about 150-200 hects of ponds & fresh water area will come under fish cultivation. The production of fresh water fish, fresh water prown and brackish water shrimp will increase significantly.
- Area under social forestry will increase significantly. Plantation of Neem, Karanja, jetropha, Uridi, medicinal and aromatic plants will get an enthusiastic response.
- The production of katha and resin will also increase.
- Area under improved varieties of mulberry plants will increase. As a result, the number of silk worms will also increase.
- Significiant increase in honey production is expected.
- Mushroom production will also increase from the present level.
- Vermi compost, green manuring, bio-fertalizers etc will become more popular among the farming community.
- There will be a significiant increase in the net profits of farmers after the adoption of cleaning, grading, processing and packing techniques for agricultural, horticultural and animal products and also due to the improvement in marketing infrastructure and marketing techniques. These projections are based on the interactions with farmers and micro study of some villages in Una district by ATMA Una.

Chapter - I

Introduction

Taking the notice of slow growth in agriculture and allied sectors, the National Development Council (NDC) reaffirmed its commitment to rejuvenate agriculture by achieving 4 per cent annual growth rate during the 11th five year plan. It made agriculture growth as an essential element of the strategy to make growth more inclusive and passed a resolution to actualize the envisaged growth rate. The Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India in compliance with NDC resolution and in consultation with the Planning Commission, has prepared the guidelines for Rashtriya Krishi Vikas Yojana (RKVY). For proper decentralized planning, each district is required to formulate a Comprehensive District Agriculture Plan (C-DAP) by including the resources from other existing schemes i.e. central sponsored and state sponsored.

The Comprehensive District Agriculture Plan (C-DAP) aims at moving towards projecting the requirements for development of agriculture and allied sectors in the district. Therefore the C-DAP is not only the usual aggregation of the existing schemes but it would present the vision for development of agriculture and allied sectors within the overall perspective of the district.

The C-DAP would present the financial requirements and sources of finance for agriculture development in a comprehensive way. It would also include animal husbandry, fishery, dairy, minor irrigation, agriculture marketing, forestry, water harvesting and conservation of natural resources, keeping in view the technological possibilities in the district.

The present C-DAP analyses the current situation of agriculture and allied sectors in the district Una and also describes the needs and potentials along with statement of objectives and analysis of ongoing as well as new schemes and programmes. The District Plan discusses what the district will try to achieve over a medium term of five years and how it intends to achieve it. The C-DAP also contains an action plan along with tentative financial outlay with a provision of continuous updating.

Objectives

The aim of C-DAP is to design an integrated and participatory action plan for the development of agriculture and allied sectors within the purview of overall development of local area. The basic grassroots level data have been collected to fulfill the aim of the district plan. The objectives of district plan are;

- to prepare a C-DAP through participatory methods involving various departments, organizations and stakeholders;
- to assess and plan for the infrastructure required for the development of agriculture;
- to identify the enabling factors for optimal utilization of scarce natural, physical and financial resources;
- to strengthen linkages with required institutional support services like credit, technology transfer, research and extension; and
- to evolve an action plan for achieving sustainable agricultural growth with food security, growth oriented cropping system and development of allied sectors that will improve income of the farmers.

In nutshell, the C-DAP deal with the following major concerns of the rural economy in general and agricultural sector in particular. These concerns are as follows;

- **The sustainability concern** which demands worth-while strategies that would directly address to conserve the soil fertility, water and environment resources
- **The growth concern** which requires huge investment and support in terms of infrastructure and incentives to trigger growth by increasing productivity of main crops as well as harness the potentials in numerous high value alternatives in specialized pockets.
- **The equity concern** which demands improving the economic condition of small and marginal farmers and landless households.
- **The finance concern** which demands decision on regulation of informal lending to the farmers in financial institutional infrastructure, the lending and investment policies, more efficient use of public resources and increase in public investment; and
- **The employment concern** which empowers rural poor through capacity building/training. It demands employment oriented industrial policy which encourages establishment of agro-processing industries in rural areas, ensures local employment and designs training programmes in collaboration with industry/service sectors.

Agricultural policy

No, doubt, the state government, as per its agricultural policy, is trying its best for the development of agriculture in the state, but there is further need to develop and popularize an integrated model of agriculture development by preparing a C-DAP by adressing the agriculture related issues dealing with;

- enhancing the productivity and quality of crops/fruits;
- replacing low productive varieties of crops/fruits with high yielding varieties;
- raising the crop intensity of existing cultivable land;
- focusing on diversification towards high valued crops and protection for the same;

- increasing more area under irrigation by tapping available untapped sources of water through people's participation;
- emphasizing on integrated watershed development programmes with full participation of project beneficiaries;
- providing insurance cover for major crops to check the risk of crop failure;
- involving of Panchayati Raj Institutions (PRIs) in agricultural development programmes;
- women emancipation through agriculture development;
- utilizing of environment friendly practices for crop/horticulture production and marketing;
- integrating cultivation with processing and marketing; and
- increasing the use of frontier technologies like Remote Sensing, Information Technology and Bio-technology in the field of horticulture.

Methodology

The C-DAP of Una district has been prepared keeping in view the major concerns of the rural sector of Himachal Pradesh, particularly the agricultural sector, the agricultural policy pursued by the state, and the broad guidelines provided by the National Development Council and the Planning Commission of India. To complete this exercise the following course of action was adopted:

- reliance on secondary data, irrespective of its quality;
- conducting village level surveys by applying exhaustive questionnaires;
- frequent field visits;
- meetings with the farmers of different categories;
- discussions with the block/district level functionaries; and
- Mapping of resource endowment, habitation, infrastructure, socio-economic profile of population, land use and cropping pattern etc.

Use of Secondary Data and Data Sources

The research team tried to take the maximum benfit of available secondary data for understanding the natural and human resource base of the district, distribution of infrastructural facilities in the district, broad patterns of land use, extent and intensity of irrigation, cropping pattern and cropping intensity, productivity trends and production levels of main crops, etc. The main sources of the data were: (i) the village directory of the district maintained by the district administration, (ii) the Statistical Abstracts of Una and Himachal Pradesh, (iii) the information provided by various departments; and (iv) certain published as well as unpublished reports and maps.

Primary Data Collection

In order to understand the major constraints in the overall development of the district in general and agriculture and allied sectors in particular, to assess the potential for growth in each village, and to know the priorities of the people, the primary data were collected by filling up questionnaires from each village. Three different questionnaires were prepared for this purpose. One questionnaire focuses on land resources, size of land holdings, and cropping pattern. The answers to the questions, listed in this questionnaire, are provided by the village revenue officer (Patwari) from each village. The second questionnaire focuses on the role of Primary Agricultural Cooperative Societies, providing agricultural credit and other facilities to the farmers. The secretaries of the societies were approached for filling up these questionnaires. The third questionnaire which is more exhaustive, contains questions focusing on the common resources of the village community, income of PRIs from all sources and potential for enhancement of village income, potential for rain water harvesting, present status and future prospects of micro irrigation systems, organic farming, horticulture, cultivation of medicinal and aromatic plants, floriculture, agro-forestry, dairy farming, fishery, poultry, beekeeping, etc. It also tries to explore the scope of rural tourism in the district. Efforts are made to know the priorities of the people for development works in the villages during the XI plan period. For collecting information through questionnaires, the services of field staff were utilized. A one day workshop was organized to impart training to rural development staff in all the 5 blocks for collecting required information through questionnaires. They were requested to go to every village, hold Gram Sabha meetings in consultation with village Sarpanch and other members of the Panchayat and explain the objective of the exercise to them. The questionnaires have been filled from the village sarpanches after thorough discussions with members of the respective Gram Sabhas. It is necessary to mention here that the task of collecting primary data was facilitated at every step by the office of the Additional Deputy Magistrate, Una. Even much of the secondary data were also provided by the same office.

The whole exercise of collecting primary data was started from the grassroot level by involving the village community to get relevant information important for area specific recommendations.

Field Visits and Discussions with the farmers

To gain familiarity with the local conditions, the study team organized a number of visits to cover the different parts of the district. During these traverses, the man-land relationships were observed at the micro level. The study team also held informal meetings with individuals as well as groups of farmers, dairy farmers, fish farmers, poultry farmers, bee keepers, horticulturists, floriculturists and vegetable growers to know their problems and also their views about different schemes of the government. Meetings with some of the progressive farmers in the district who have made significant contribution in

crop sector, horticulture, vegetable sectors, bee keeping, fish farming and agro-forestry in the district provided significiant inputs in the preparation of plan. Similarly young educated farmers who are trying to use the modern technologies in agriculture and allied sectors were also approached. Likewise a meeting with progressive dairy farmer provided a good input about the scope of commercial dairy farming in the district. The team also met functionaries of one NGO, engaged in the general welfare of the village society in Gagret block and also to the members of a Self Help Groups in some villages. The meetings, with all shades of farmers and others, immensely helped us in understanding the prevailing situation and possibilities of development of agriculture in the district.

Discussions with Block/District level functionaries

The study team visited the district level offices of the different departments such as agriculture, horticulture, soil conservation, animal husbandry, dairy farming and fishery as well as the Krishi Vigyan Kendra (KVK) at Una and held discussions with the functionaries of the departments/centres regarding various schemes operated by them as well as about the proposals prepared by them for the development of agriculture & allied sectors. The team also visited offices of the Block Development and Panchayat Officers in all the blocks to know about the ongoing developmental works in the blocks, the problems and potentials of each block and functioning of PRIs.

Processing of data

The collected primary and secondary data were processed using simple statistical techniques like averages, ratios, percentages, ranking, dispersion etc. To meet the basic requirement of micro-level planning, the processed data were graphically represented through tables and diagrams using appropriate techniques. By using village level data, a large number of tables such as distribution of population, inhabitations, socio-economic profile of the population, infrastructure facilities, land use and cropping pattern, possible changes in land use and cropping pattern in the near future, present status of allied activities like dairy, animal husbandry, poultry, fishery, bee-keeping etc were prepared. People's priorities for development works in the villages too were tabulated to see whether or not they form some meaningful spatial pattern. The depiction of data helped in the identification of spatial gaps in the distribution of infrastructural facilities. The tables also revealed the association of cropping pattern with the type of soils, amount of rainfall and availability of water for irrigation. Data analysis helped us to asses the problems and potentials of different areas at the micro level which was very helpful in the formulation of this plan.

The above exercise helped us to gain sufficient degree of familiarity with the local conditions, assess the problems and potential of different areas in respect of major crops, fruits and vegetable cultivation, cultivation of spices, medicinal and aromatic plants, agro-

forestry, dairy and other allied activities, know the priorities of the people, and examine the profile of existing infrastructure and services – in terms of their distribution, accessibility and utilization. While carrying out this exercise, the public policy and pronouncement have also been given due attention.

Against this backdrop, the team specifically concentrated on the following points:

- Identification of the spatial gaps in the distribution of infrastructure facilities;
- Review of ongoing schemes relating to agriculture and allied sectors;
- Evaluation of new proposals and schemes for the development of agriculture and allied sectors in the district by the concerned government departments;
- Assessing the role of PRIs, Cooperatives, HIMFED, KVK, Village Forest Committees, certain private agencies and progressive farmers in the development of agriculture including cultivation of fruits, vegetables, medicinal and aromatic plants; dairy farming; fisheries; bee keeping; extension of tree cover; and
- Assessing the need for improvement of soil health, water conservation, organic farming and improvement of natural environment.

Efforts are made to suggest sub-sector specific proposals along with their financial requirement and government support in the form of subsidy/incentives, etc.

Chapter- II
General Description of the District

2.1 Introduction

This chapter provides a general description of Una district. It includes location of the district; organization of the district for administrative and community development purposes; physical, human and economic resource base of the district; and a development vision of the district. The chapter is divided into three main sections. Section 2.1 includes a general reference map of the district, tables about general statistics of the district and information regarding crops, breeds, fisheries, etc. The information with regard to physical, human and economic resource base is provided in section 2.2. The development vision of the district for the next 10-15 years along with the strategies to realize that vision is provided in section 2.3. The chapter also includes 22 maps which provide insight into the various aspects of the district visually.

(i) Maps of the district

This chapter includes 13 maps focusing on various aspects of the district. The general reference map of the district (Map-2.1) shows the district, tehsil/sub-tehsil, C.D. block boundaries, drainage lines, main roads, railway line, location of urban centres and district/tehsil/sub-tehsil headquarters. The map serves as an important source of general information about the district. The other maps show administrative boundaries, C.D. block boundaries, distribution of large size villages and urban centres, distribution of scheduled caste population, total literacy and female literacy, agro-ecological situations, distribution of small and marginal operational holdings, net sown area, cultivable waste lands, pastures and grazing land and net irrigated area. These maps have been given at the end of this chapter. Whereas maps regarding the demographic characteristics of the population are based on village level data of 2001 census, the maps regarding land use of the district are based on the village level data collected from the village revenue officers (Patwaris). The general Reference map and administrative maps have been developed from block maps prepared by census of India. The map of AESs is taken from ATMA report Una.

(ii) General Statistics

This chapter also includes a large number of tables which provide basic statistics with regard to physical and various socio-economic aspects of the district. These tables helps in understanding the physical and socio-economic base of the district which is very essential for formulating appropriate strategies for the development of agriculture and allied sectors in Una district. These tables have been provided at relevant places in section 2.2 of this chapter.

(iii) Crops and Animals

Crop	Varieties
Wheat	Mostly improved varieties Local varieties in AES-IV
Maize	Hybrid as well as local
Paddy	Mostly local varieties
Potato	Improved varieties like kufri chandramukhi and kufri Jayoti
Other Vegetables	Improved as well as local varieties
Fruits	**Varieties**
Mango	Desi in case of old orchards/individual trees. Grafted varieties like dusehri, langra, chausa etc in case of new orchards
Citrus	Mostly local varieties
Litchi	Budded varieties
Animal	**Breeds**
Cow	In AES I and II mostly local breeds In AES III and IV mostly improved breeds
Buffalo	Mostly local breeds
Goat	Mostly local breeds
Habitat	**Species**
Ponds, Tanks Rivers	Mirror carp, grass carp Mahaseer and rohu

(iv) Activities

Crop husbandry, horticulture and animal husbandry (including milk production) are the main economic activities in the rural areas of Una district. The minor economic activities are forestry related works like plantation, lumbering and gathering of forest products, fisheries, sericulture, etc. About 2 % of workers are also engaged in household industry.

2.2 District at a Glance

This section provides quick insight into the various facets of Una district, such as, location, geographical units, demographic profile, agro-climatic characteristics, land use pattern, size of land holdings, irrigation, groundwater, district income and intra-district growth differentials.

2.2.1 Location and Geographical Units

The district is located in the sub-mountainous zone of Himachal Pradesh along the interstate boundary between Himachal Pradesh and Punjab. It extends from 31°-17′- 52″ to 31°-52′- 0″ north and 75°-58′- 02″ to 76°-28′-25″ east longitude. The total geographical area of the district is 1540 sq. km which is 2.8 % of the total area of the state. The major portion of the district falls in the structural valley (valley formed by techtonic processes like folding and faulting), locally called as doon, which is drained by river Soan (also spelled as Swan) and its tributaries. Prior to reorganization of Punjab in 1966 the district was part of Hoshiarpur district of Punjab as one of its tehsils with tehsil headquarters at Una. After re-organization Una tehsil along with some other hill areas of Punjab was

transferred to Himachal Pradesh and Una become one of the tehsils of Kangra district. In 1972 Una was accorded the status of a district.

The district can be divided into two main physiographic regions that is (i) Rainfed Hilly Tract with elevation between 450-900 metres or above and (ii) Irrigated Plain Valley Tract with elevation between 350-450 metres from the MSL. For administrative purposes the district is divided into four tehsils (Una, Amb, Haroli and Bangana) and one sub-tehsil (Bharwain). For development purposes the district is divided into five C.D. blocks, that is, Una Amb, Gagret, Bangana and Haroli. (see maps 2.2 and 2.3).

The main source of income for the people in the district is agriculture and allied activities. The total number of villages and towns in the district are 758 and 5 repectively. The district has 253 gram panchayats of the total 3243 gram panchayats in Himachal Pradesh (7.8 per cent of total panchayats in the state). Out of the 551 gram panchayts which have been declared as backward Panchayats, the district has only 3 backward Panchayats. This shows that whereas about 17 % of the total Panchayats in the state are backward, in Una district their proportion to total population is just 1.3 %.

Table-2.1
Tehsil wise General Information of Una District

S. No.	Tehsils &Sub Tehsils	No. of Villages			No. of towns	Total Geographical area in hects (2005-06)	Population (2001)			Sex ratio (2001)		
		In-habited	Un-inhabited	Total			Rural	Urban	Total	Rural	Urban	Total
1.	**Amb**	243	-	243	2	49657	137110	6535	143645	1021	1075	1023
2.	**Bangana**	306	-	306	-	41851	64347	-	64347	1028	-	1028
3.	**Una**	139	-	139	3	33477	131890	32889	245390	976	889	956
4.	**Haroli**	25	-	25	-	19883	59179	-	59179	1017	-	1017
5.	**Bharwain (S.T)**	45	-	45	-	10055	16323	-	16323	1027	-	1027
	District	758	-	758	5	154923	408849	39424	448273	1007	895	999

Source: Statistical Abstract Una (Himachal Pradesh)

Table-2.2
Block wise General Information of Una district

Blocks	Total Area (In Sq. Kms)	No. of Inhabited Villages	Blockwise % distribution of total Population (2001)	Density of Population (Per sq. km)	Percentage of Schedule Castes to total Population
Amb	314.98	195	19.8	258	21.6
Bangana	412.54	306	**15.7**	156	19.3
Gagret	248.15	92	17.7	291	20.3
Una	222.28	109	25.2	463	21.2
Haroli	298.84	56	21.5	295	17.6
Total	1496.79	758	408849 (100)	273	93114 (22.8)

Source: Census of India, 2001

2.2.2 Demographic Profile

Population Size and Density

As per census 2001, the total population of Una district is 4,48,273. Although, total area of district Una is only about 2.8 % of the area of the state, it accounts for about 7.4 per cent of the total population of Himachal Pradesh. This indicates a comparatively much higher concentration of population in the district. Compared to a density of 109 persons per sq.

km in the state, the district has a density of 291 persons per sq. km. The density of rural population is 273 persons per sq. km. Within the district the density of rural population varies from 156 persons per sq. km in Bangana block to 463 persons per sq. km in Una block. Only about 8.8 per cent of the population in the district is located in urban areas. The average for the state is 9.8 per cent. Thus, the population in the district as well as in the state is overwhelmingly rural. Map 2.4 shows the distribution of large size villages and urban centres.

SC & ST Population

The proportion of scheduled caste population to the total population in the district is about 22.4 per cent which is less than the average for the same (24.75) in the state. Within the district the proportion of SCs to total population varies from 10.2 % in Una tehsil to 31.2 % in Bharwain sub-tehsil. In 90 villages of the district, mostly in Bangana tehsil and Bharwain sub tehsil, proportion of SCs to total population is more than 50%. The distribution of such villages is shown in map no. 2.5. The proportion of STs in the total population of Una district is comparatively much lower (1.3%) than the state average (5.9%).

Table-2.3
Tehsilwise Percentage of SCs and Literacy Rate among rural and urban and male and female (Census-2001)

S. No.	Tehsils & Sub tehsils	% of SCs in total population	% of STs in total population	Literacy rate (including 0-6 year population)				
		Percentage	Total	Total	Rural	Urban	Male	Female
1.	Amb	23.6	N.g	72.6	72.3	79.4	77.2	68.1
2.	Bangana	28.0	-	68.2	68.2	-	73.5	63.0
3.	Una	10.2	-	69.4	69.1	70.5	74.6	63.8
4.	Haroli (S.T)	19.0	N.g	63.7	63.7	-	71.1	56.5
5.	Bharwain (S.T)	31.2	-	73.7	73.7	-	79.5	68.2
	District	22.4 (100588)	0.01 (51) *1.34 (59.86)	69.7	69.4	72.0	75.1	64.3

Source: Census of India, 2001
*****After declaring Gaddi and Gujars as STs in January 2003

Literacy

Despite constraints of hilly terrain, remote areas and certain trans-humance groups which remain on the move for most part of the year, Himachal Pradesh has done extremely well in the field of education. As per 2001 census, Himachal is having a literacy rate (excluding 0-6 year population) of 76.5% (85.3% or males and 67.4%) which is higher than the literacy rates in the adjoining states of Punjab, Haryana and Jammu & Kashmir. However, there are marked differences in the rural and urban literacy rates as well as male and female literacy rates in the state. Literacy rates in Una district for total, male and female population as well as for the total, male and female population in rural and urban areas (excluding 0-6 year population) are comparatively higher than the corresponding rates for the state (see table 2.4). If 0-6 population is also included, the literacy rates for the total,

male and female population in Una district comes to 69.7%, 75.1% and 64.3% repectively. The literacy rate in urban areas is 72.0% and in rural areas 69.4 %. (see table 2.3). Table 2.3 also shows differences in literacy rates at the tehsil/sub tehsil level. Where as Bharwain sub-tehsil recorded the highest (73.7%) literacy rate, Haroli sub-tehsil recorded the lowest literacy rate. Although literacy rate in the district is fairly high, yet in large number of villages, mostly in the hilly parts of the district, total literacy as well as female literacy is less than 50% (see maps no 2.6 and 2.7).

Table-2.4
Percentage of Educational/Literacy Status in Una and HP, (2001)

District/State	Total			Rural			Urban		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Una	88.5	73.9	81.1	88.7	73.5	80.9	87.0	78.0	82.7
HP	85.3	67.4	76.5	85.2	66.3	75.7	92.5	85.9	89.6

Literacy rates are for population excluding 0-6 age category
Source: Census of India, 2001

Economy of the District

The table 2.5 shows districtwise Gross Domestic Product (GDDP) in 2002-03 and 2005-06 and percentage growth during this period. The table also shows the districtwise per capita in the same years and percentage growth during 2002-03 to 2005-06. It shows at district Una experienced 137.17 % increase in GDDP during 2002-03 to 2005-06 as compared to only 58.45 % growth in the state. Likewise there was an increase of 121.65 % in the per capita income in the district as compared to only 49.17 % increase in the state during the same period.

Table-2.5
Himachal Pradesh – Districtwise Gross Domestic Product (GDDP) at Current Prices

(Rs. in crore)

Districts	GDDP		Percentage change 2005-06/2002-03	Per capita income (in Rs.)		Percentage change 2005-06/ 2002-03
	2002-03	2005-06		2002-03	2005-06	
Bilaspur	1000	1442	44.20	24594	33468	36.08
Chamba	1050	1305	24.29	20403	23059	13.02
Hamirpur	730	1631	123.42	14538	32161	121.22
Kangra	2956	4833	63.50	18798	29495	56.90
Kinnaur	325	505	55.38	34156	53253	55.91
Kullu	1026	1742	69.79	25580	38446	50.30
L & Spiti	177	301	70.06	41718	73195	75.45
Mandi	1869	2796	49.60	17881	25303	41.51
Shimla	2613	3640	39.30	31491	41590	32.07
Sirmaur	1228	1801	46.66	23259	31348	34.78
Solan	2444	3679	50.53	40116	55271	37.78
Una	756	1793	137.17	14656	32485	121.65
Himachal Pradesh	**16174**	**25468**	**58.45**	**22671**	**33819**	**49.17**

Source: Mid-Term Appraisal of the Eleventh Five Year Plan of Himachal Pradesh

The table 2.6 shows sectorwise contribution to GDDP in Una district. It reveals that the share of Agriculture and Animal Husbandry increased from 19.0 % in 2002-03 to 23.0 %

in 2005-06. This shows that Agriculture and Animal Husbandry is not only the main contributor to the GDDP but its contribution to the GDDP is also increasing.

Table-2.6
Una District - Sector/Activity-wise GDDP for 2002-03 and 2005-06 at Current Prices

(Rs. in lakh)

Sector/ Activity	2002-03	2005-06	% change
Agriculture and Animal Husbandry	14362 (19.0)	41425 (23.0)	188.4
Forestry & Logging	2245 (3.0)	3837 (2.1)	70.9
Fishing	248 (0.3)	255 (0.1)	2.8
Mining & Quarrying	181 (0.2)	244 (0.1)	34.8
Manufacturing	6417 (8.5)	10464 (5.8)	63.1
Construction	10587 (14.0)	38735 (21.6)	265.9
Electricity Gas & Water Supply	5036 (6.7)	12670 (7.1)	151.6
Transport Storage & Communication	4447 (5.9)	9723 (5.4)	118.6
Trade Hotel & Restaurant	7916 (10.5)	21378 (11.9)	170.0
Banking and Insurance	2396 (3.1)	9303 (5.2)	288.3
Real estate & Dwelling etc	3824 (5.0)	7767 (4.3)	103.1
Public Administration	7274 (9.6)	8384 (4.7)	15.3
Other Services	10644 (14.1)	15139 (8.4)	42.2
Total	75576 (100.0)	179323 (100.0)	137.3

Source: Mid-Term Appraisal of the Eleventh Five Year Plan of Himachal Pradesh

Work participation

As per census 2001, the percentage of workers both main and marginal in the state is 49.2 per cent. The comparable figure for Una district is 45 per cent. Therefore, the work participation ratio is lower in Una than the state average. The work participation in the industrial categories shows that Una is still an agriculture dominated district and the primary sector is the backbone of its economy.

Table-2.7
Category wise percentage of workforce to total workers (main workers & marginal workers) in Una and Himachal Pradesh

Districts	Cultivators		Agricultural labourers		Household workers		Other workers	
	Total	Rural	Total	Rural	Total	Rural	Total	Rural
Bilaspur	68.5	71.7	1.7	1.7	1.6	1.6	28.1	25.0
Chamba	72.7	76.9	0.7	0.7	1.2	1.2	25.4	21.2
Hamirpur	69.9	73.3	1.6	1.4	1.4	1.2	27.1	24.1
Kangra	56.9	59.1	6.7	6.9	3.3	3.2	33.1	30.7
Kinnaur	64.8	66.7	2.3	2.2	1.8	1.8	31.1	29.3
Kullu	76.0	80.6	2.6	2.6	1.3	1.2	20.1	15.6
Lahul & Spiti	52.9	53.1	1.6	1.6	0.6	0.5	44.8	44.8
Mandi	72.5	75.9	1.4	1.4	1.5	1.4	24.6	21.3
Shimla	64.2	77.7	2.6	3.0	1.2	1.1	32.0	18.2
Sirmaur	71.5	76.4	2.5	2.6	1.2	1.1	24.8	19.9
Solan	54.5	64.5	2.4	3.1	1.2	1.2	41.9	31.2
Una	57.1	60.4	5.6	5.8	2.0	1.9	35.3	31.9
Himachal Pradesh	**65.3**	**70.4**	**3.2**	**3.3**	**1.7**	**1.7**	**29.8**	**24.6**

Source: Census of India, H.P. Paper-3 of 2001

The work participation as cultivators is lower in the district than state average. Urbanization and industrialization in few parts of the district have significantly influenced the traditional occupation of the local population because of direct or indirect employment opportunities in these projects.

Table-2.8
Percentage of main workers, marginal workers and non-workers in the total population

Districts	Main Workers	Marginal Workers	Non Workers	Total
Bilaspur	32.5	16.4	51.1	100
Chamba	27.9	22.1	50.0	100
Hamirpur	29.0	20.8	50.2	100
Kangra	25.2	18.8	56.0	100
Kinnaur	51.5	9.1	39.0	100
Kullu	43.7	13.1	43.2	100
Lahul & Spiti	57.8	5.7	36.5	100
Mandi	29.8	20.6	49.6	100
Shimla	42.3	8.9	48.8	100
Sirmaur	38.4	10.9	50.7	100
Solan	34.4	18.2	47.4	100
Una	26.6	18.4	55.0	100
Himachal Pradesh	32.3	16.9	50.8	100

Source: Census of India, HP, 2001

Table-2.9
Percentage of working population by Industrial categories in Una & Himachal Pradesh (2001)

S. No.	Industry Category	Una	Himachal Pradesh
1	Cultivators	60.4	70.4
2	Agricultural Labour	5.8	3.3
3	Workers in household industries	1.9	1.7
4	Other Workers	31.9	24.6
5	Total Workers (main and marginal)	100	100

Source: Census of India, HP, 2001

Table-2.10
Blockwise General Information of Una district

Blocks	Percentage of Literates to total Population (including 0-6 population)	Percentage of main workers to total Population	Percentage of Cultivators to total Population	Percentage of Agriculture Workers to total Population	Percentage of Agriculture Workers to total Workers
Amb	71.6	30.5	17.1	10.0	32.6
Bangana	68.2	28.1	19.8	6.6	23.5
Gagret	73.1	27.0	15.4	8.5	31.3
Una	69.2	19.9	10.0	8.0	40.0
Haroli	65.4	13.1	6.6	5.2	40.0
Total	69.4	23.1	13.7	7.7	35.1

Source: Census of India, 2001

2.2.3. Topography and Agro-Climatic Characteristics

(i) Topography

As mentioned earlier the district is located in the sub-mountanious Shiwalik Hill Zone. More than two thirds of the district has an elevation between 350-600 metres and about one third between 600 to 900 metres from the MSL. Only a few ridge tops and peaks has

elevation more than 900 metres. The area display a highly dissected topography carved by the numerous seasonal streams flowing from the hills to the main river Soan and Lunkhar Khad (now part of Govind Sagar).

The general slope of the district is from northwest to southeast that is the direction of flow of river Soan and Lunkhar Khad. But at the sub-regional level the district can be divided into four slope facets on the basis of slope aspect, which are at right angle to the regional slope of the area. Two of these slope facets on either side of river Soan dips towards the river and the other two similarly dips towards Lunkhar Khad from either side. The slope gradient in most of the district is less than 10 metres per km. it is between 10-20 metres in the hilly areas with elevation more than 600 metres.

(ii) Climate

District Una receives a good quantum of precipitation i.e. between 900-1200 mm in valley tract and 1200-1400 in hilly tract. The district has two rainy seasons in a year. One from January to February which is associated with the movement of western disturbances and other one extends from middle of June to middle of September caused by the south-western monsoons. The major portion of precipitation (more than three-fourth) is received in the monsoon season. The normal rainfall in Una district is about 1095 mm which is less than the state average of 1435 mm.

Table-2.11
Monthwise rainfall recorded at Una since 2005 (Rainfall in MM)

S.No	Year	Jan.	Feb.	Mar	Apr.	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Total
1.	2005	28.20	95.6	67.2	2.00	9.2	60.2	2.21	222.8	86.64	0	0	0	792.84
2.	2006	28.6	0	66.0	2.8	101.8	134.8	172.8	361.4	120.2	11.4	2.6	30.6	1033.0
3.	2007	NIL	81.8	130.8	20.4	25.0	48.8	225	386.0	51.6	4.2	00	23.0	794.1
4.	2008	24.8	14.2	0	20.4	12.2	246.6	48.0	394.6	NA	NA	NA	NA	NA
	State (H P) Normal Rainfall	89.9	80.1	87.8	49.2	51.7	99.6	36.38	339.3	165.4	49.4	15.1	43.3	1434.6
	Normal Rainfall In Una District	51.5	48.1	41.3	18.5	16.8	86.7	338.4	284.9	150.6	28.1	4.7	25.2	1094.8

Source: District Statistical Office, Una

The monthwise average rainfall information of three raingauge stations namely Una, Amb and Bangana is shown in Table- 2.10.

Table-2.12
Raingauge station at tehsil Headquarter Amb (Rainfall in MM)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
2003	56.0	7.0	3.0	3.0	1.0	30.0	223.0	266.0	301.0	-	13.0	7.0	1037.0
2004	77.0	8.0	-	25.0	8.0	91.0	146.0	125.0	91.0	66.0	3.0	31.0	671.0
2005	30.0	111.0	43.0	8.0	7.0	77.0	389.0	159.5	120.0	1.0	-	-	945.5
2006	12.0	3.0	51.0	5.0	103.0	26.0	237.0	431.0	72.0	52.0	6.0	24.0	1092.0
2007	-	110.0	124.0	22.0	21.0	109.0	177.0	462.0	62.0	2.0	-	20.0	1109.0
2008	45.0	7.0	--	16.0	49.0	277.0	557.0	628.0	62.0 upto 29.9	NA	NA	NA	1641.0

Source: District Statistical Office, Una

Table-2.13
Raingauge station at tehsil Headquarter Bangana (Rainfall in MM)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
2003	77.2	101.0	93.2	13.0	-	84.0	552.0	235.0	366.0	-	10.0	-	1531.4
2004	121.0	15.0	-	47.0	12.0	167.0	365.0	199.0	139.0	155.0	5.0	27.0	1252.0
2005	65.0	142.0	63.0	8.0	102.0	58.0	292.0	337.0	114.0	-	-	-	1181.0
2006	41.0	-	121.0	-	81.0	187.0	333.0	267.5	112.0	8.0	8.0	29.2	1187.7
2007	-	97.8	133.5	33.5	8.0	147.7	232.5	526.5	98.3	-	-	18.5	1296.3
2008	39.2	14.0	14.2	38.2	57.0	260.3	509.7	461.8	71.0	-	-	-	1465.1

Source: District Statistical Office, Una

Table-2.14
Raingauge Station at District Headquarter Una (Rainfall in MM)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
2003	38.0	71.2	69.0	27.0	3.8	123.4	209.6	254.6	107.6	-	17.6	1.6	923.8
2004	100.2	5.6	-	21.6	20.0	55.0	235.6	237.0	66.6	160.6	1.8	15.2	919.2
2005	28.2	95.6	67.2	2.0	9.2	60.2	221.0	222.8	86.6	-	-	-	792.0
2006	28.6	-	66.0	2.8	101.8	134.8	172.8	361.4	120.2	11.4	2.6	30.6	1033.0
2007	-	81.8	130.8	20.4	25.0	48.8	225.0	386.0	51.6	4.2	-	23.0	996.0
2008	24.8	14.2	-	20.4	12.2	246.6	181.2	394.6	132.2	-	-	-	1026.2

Source: District Statistical Office, Una

Table-2.15
Month-wise Average Rainfall of Three raingauge stations (Una, Amb and Bangana) (Rainfall in MM)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
2003	57.0	87.4	66.9	14.3	1.6	79.1	328.2	251.9	258.2	-	-	13.5	1158.1
2004	99.4	9.5	-	31.2	13.3	104.3	248.9	187.0	98.9	127.2	127.2	3.3	1050.2
2005	41.0	116.2	57.7	6.0	39.4	65.0	300.7	239.8	106.9	-	-	-	972.7
2006	27.2	1.0	79.3	2.6	95.3	139.3	247.6	353.3	98.1	23.8	23.8	5.5	1096.8
2007	-	96.5	129.4	25.3	18.0	101.8	211.5	458.16	70.4	2.1	2.1	-	1115.26
2008	36.3	11.7	4.7	24.9	39.4	261.2	416.0	494.8	88.4	-	-	-	1377.4
Normal Rainfall	51.5	48.1	41.3	18.5	16.8	86.7	338.4	284.9	150.6	28.1	28.1	4.7	1097.7

Source: District Statistical Office, Una

Temperature is also prone to high degree of extremities like rainfall. Temperature is also significant for the production of agricultural crops and other enterprises. The mean minimum temperature various between 4°C to 6°C in January and mean maximum around 36°C in June in Una. But, the minimum temperature in the district can drop to freezing point during January and can go upto 44°C in the month of May-June. Generally May and June are the hottest months of the year. Similarly December and January are the coldest one. Some parts of the district often experience fog and frost in winter season, (January to February). The winter months, particularly when the night temperature is below 4°C are not conducive for the germination of seeds and growth of plants. The deciduous plants become dormant in this period which is an ideal time for their transplantation.

Table-2.16
Weather Information of Una district

Month	Year 2006			Year 2007		
	Rainfall mm	Temperature		Rainfall mm	Temperature	
		Mean Max	Mean Min		Mean Max	Mean Min
Jan	10.8	28.50	7.19	0.0	21.25	4.56
Feb	0.0	28.18	11.64	87.4	20.73	9.66
Mar	71.9	27.32	12.37	116.1	25.28	11.65
Apr	11.4	34.30	16.67	16.8	34.87	18.05
May	68.0	36.95	23.39	57.0	35.56	22.16
Jun	67.6	35.89	22.90	114.9	35.96	24.93
July	220.6	31.83	25.65	177.8	32.65	25.72
Aug	425.8	32.26	24.19	336.0	32.07	25.31
Sep	59.8	31.29	22.32	28.6	32.04	23.11
Oct	19.6	30.23	17.32	0.0	31.34	13.67
Nov	5.0	25.37	12.24	0.0	26.72	9.79
Dec	19.8	21.22	7.93	28.8	20.97	6.72

Source: District Statistical Office, Una

(iii) Agro-Ecological Situations

For adopting appropriate strategies to accelerate the process of agricultural development, the Agricultural Technology Management Agency (ATMA), District Una has divided the district into four Agro-Ecological Situations (AESs), on the basis of soil type, topography, irrigation pattern and cropping system (see map-2.8). The extent and the characteristics of each AES are as given below

(a) AES-I (Swan Bela)

AES-I includes the plain areas, having elevation ranging from 360-400 metres, of all the five developmental blocks of the district. The average annual rainfall is about 600 mm. Soils are Entisols and Inceptisols with gentle slope. The net area cultivated under this AES is about 7.07 thousand hectares which is around (19 per cent of total cultivated area of the district). Main sources of irrigation are tubewells, flow irrigation schemes and dig-wells. Cereal based cropping system and vegetables are predominant in AES-I.

(b) AES-II (Swan Har)

Like AES-I, the AES-II also spreads over all the five blocks of the district. The elevation of this AES ranges between 400-450 metres in all the five blocks of the district. Annual rainfall remains between 600-700 mm. Soils are Entisols and Inceptisols with shallow soil depth. The net cultivated area in this AES is about 18.5 thousand hectares which is almost 45 per cent of the net cultivated area of the district. Irrigation facilities are partial here. Foodgrains, vegetables and fruit based cropping system are predominant.

(c) AES-III (Beet Area)

Area of AES-III is spread over Haroli block having elevation between the range of 450-500 metres. Average rainfall is about 700 mm and soil types are mainly Inceptisols. The topography is generally undulating and soil texture varies from sandy clay loam to clay loam with good soil health. The soils are generally neutral in reaction. The net cultivated area in this AES is 5.16 thousand hectares which is almost 13.3 per cent of the net cultivated area of the district with inadequate irrigation facilities. Cereal, vegetables, fruits (especially mango and citrus) and sugarcane are the predominant crops of AES-III.

(d) AES-IV (Mid Hills)

The area of AES-IV includes the parts of Bangana, Amb, Gagret and Una blocks. The altitude ranges are between 450-900 metres. The average annual rainfall ranges from 900-1300 mm. Topography is hilly and undulating with several soil erosion problems. Food grains, pulses and fruits are the major crops in AES-IV. The net cultivated area is around 8.11 thousand hectares which is almost 21 per cent of the net cultivated area of the district. The irrigation facilities in this AES are insufficient /meager.

On the basis of the information mentioned above, it can be said that the natural resource base of the district suffers from a number of problems such as;

- Undulating topography, shallow to medium soil depth, steep slopes, coarse texture, poor soil structure and relatively scanty vegetative cover in rainfed hilly tract of the district;
- Coarse textured soils which are deficient in major and micro nutrients;
- Low water holding capacity of soil;
- Losses of soil health due to mono-cropping sequence;
- Some areas of the district are infested by soil erosion, gully erosion, rill erosion, water logging, perennial weeds and alkalinity/salinity/acidity etc;
- Despite of sufficient annual rainfall, limited irrigation facilities;
- Deforestation due to regular cutting of forest trees;
- Severe infestation of Lantana and Parthenium in forests/grasslands; and
- Infestation of Ageratum in arable and non-arable land

2.2.4 Land use pattern and Land Holdings

As per the records/reports of Surveyor General of India, the total geographical area of the Una district is 1540.2 sq kms which is 2.8 per cent of the total area of the state. The percentage of net sown area to the total area in the district is 23.9 per cent as compared to the state average of 10.5 per cent; that is almost two and a half times more than the state average. By contrast only 12 % of the area in the district, as compare to 20 % in the state is under forest. In comparison to the state average of 20 per cent area under barren, uncultivable and non-agricultural lands, Una district has 33 per cent under this category. Cultivable waste, grazing, tree crops and groves land is almost similar to the state average. The state as a whole has only 1.3 per cent of land under current fallow whereas Una has 4 per cent area under this category. There is a vast scope to develop this area as cultivable land. Una district has an edge over the state average in case of crop intensity which is 193 % against the state average of 176 %. It shows that the existing sown area in the district is largely double cropped. Only 19.3 per cent of the total net sown area in the state is irrigated. Out of the total, 1, 04,490 hectares irrigated area in the state, only 3.2 per cent is irrigated by canals, 14.8 per cent by the wells and tube wells, 0.03 by tanks and 82 per cent by other sources. In Una district 23.2 per cent of the net area sown is irrigated. The proportion of irrigated area through various sources is lift (18.9 %), wells (8.5 %), tubewells (15.3 %), tanks (56.8 %) and other sources (0.4 %).

Table-2.17
Utilization of land in Una district (Hectares)

S. No.	Particulars	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
1.	Total Geographical Area	154923	154923	154923	154923	154923	154923
2.	Total Area as per revenue records	133922	128374	135702	131362	134324	132583
3.	Forest Area	18105	18165	18153	18153	18153	18153
4.	Land put to non agricultural use	51231	51290	51103	52244	52253	51056
5.	Permanent pastures and grazing land	20214	14141	20335	20044	21344	20339
6.	Cultivable waste land	4378	4275	5008	4032	5805	6061
7.	Net area sown	39994	40503	41091	36879	36769	36974
8.	Area sown more than once	28912	29432	34463	33881	34871	34495
9.	Total cropped area	68906	69935	75554	70760	71640	71469
10.	Crop intensity	172	173	183	192	195	193

Source: Statistical outline of District Una (2007-08)

Table-2.18
Tehsil wise Land Utilization Pattern (2005-06) (Hectares)

Land utilization pattern	Una	Amb	Bangana	Haroli	Bharwain	Total
Total geographical area	33477	49657	41851	19883	10055	154923
Forest area	768 (2.3)	4062 (8.2)	8765 (20.9)	_	4558 (45.3)	18153 (11.7)
Barren, uncultivable and non-agri use land area	11078 (33.1)	17093 (34.4)	14483 (34.6)	5843 (29.4)	2559 (25.5)	51056 (33.0)
Cultivable waste, grazing and tree crops, groves, land area	9043 (27.0)	13617 (27.4)	11226 (26.8)	7344 (36.9)	1591 (15.8)	42821 (27.6)
Current fallow and other fallow land area	1321 (3.9)	1925 (3.9)	1395 (3.3)	1182 (5.9)	96 (1.0)	5919 (3.8)
Net area sown	11267	12960	5982	5514	1251	36974
Net area sown as percentage to total area	33.7	26.1	14.3	27.7	12.4	23.9
Area sown more than once	10935	12069	5355	5066	1070	34495
Total cropped area	22202	25029	11337	10580	2321	71469
Net area sown and current fallow land	11566	13606	6863	6054	1305	39394
% of cropped area to total cultivable area	52.1	54.4	60.5	57.2	56.2	55.1
Crop intensity	197	193	193	192	186	193

Source: Statistical outline of District Una (2007-08)

The distributional patterns of some of the landuse categories based on villages level data are shown in map Nos 2.9, 2.10 and 2.11.

Map-2.9 shows the distribution of villages where Cultivable Waste Land is more than 10 % of the total area. Such villages are located all over the district. This is a potential area which can be brought under cultivation.

Map-2.10 shows the distribution of villages where pastures and grazing land accounts for more than 25 % of the total area. Such villages are mostly located in the hilly areas of Bangana and Amb blocks. These villages are more suitable for livestock rearing especially sheep and goat.

Map-2.11 shows the distribution of villages where the Net Sown Area is either less than 10 % or more than 75 % of the total area. The number of villages with net sown area less than 10 % of the total area is very large. These villages are located mostly in the hilly tracts, particularly in Bangana and Amb blocks. The number of villages with net sown area more than 75 % is comparatively much smaller. Such villages are mostly located in

the Swan Bela and Swan Har AESs. Some villages in the vicinity of Bangana and along the Bangana Barsar road. The villages with high percentage of net sown area can be focused for productivity enhancement programmes. In villages with low percentage of net sown area efforts should be made to bring more area under cultivation.

Operational Holdings

The average size of operational holdings in Himachal Pradesh is small i.e. 1.1 hectares per agricultural household- even less than the national average of 1.3 hectares per household whereas the neighboring state of Punjab has an average of 4 hectares operational land per agricultural household.

So far as Una district is concerned, the average size of operational holdings per agricultural household is 1.2 hectares which is almost equal to the state average. Marginal and small landholders make about 84.5 per cent of the total landholders in the district; the percentage at the state level is even more i.e. 86.4. in case of the average size of the operational holding, the average size of holding with small holders (1-2 hect) is only 1 hectare per household in comparison to the state average where the small holder (1-2 hect), has the average size of 1.4 hectares per household. In case of other categories, i.e. marginal, semi-medium, medium and large, the averages are almost similar at district and state levels. Map-2.12 shows the distribution of villages where more than 50 % of the operational holdings are small and marginal. Most such villages are located in the hilly tracts of the district. Their numbers are comparatively less in the plain valley tract.

Table-2.19

Category wise percentage of operational holdings and total area and average size of operational holdings

S. No.	Category wise operational holdings	% of holdings in total operational holdings (Nos)		% of area in total area (Ha)		Average size of holding (Ha)		
		Una	Himachal Pradesh	Una	Himachal Pradesh	Una	Himachal Pradesh	India
1.	0-1 ha (Marginal)	59.7	67.3	20.8	25.8	0.4	0.4	
2.	1-2 ha (Small)	24.8	19.1	20.0	25.0	1.0	1.4	
3.	2-4 ha (semi-medium)	9.8	9.8	23.0	24.8	2.8	2.7	
4.	4-10 ha (medium)	4.7	3.4	23.1	18.0	5.9	5.7	
5.	>10 ha (Large)	1.0	0.04	13.0	6.4	15.2	15.7	
	Total	100 (71324 ha)	100 (91400 ha)	100 (84623 ha)	100 (979000 ha)	1.2	1.1	1.3

Source: District Statistical Abstract – 2007-08
Economic Survey, Himachal Pradesh- 2007-08
All India Report on Agriculture Census – 2000-01

2.2.5 Irrigation and Ground Water

Irrigation is the most important element of infrastructure for the development of agriculture. Out of the total geographical area of 55.67 lakh hectares in the state only 5.83 lakh hectares (10.5 per cent) is under cultivation. It is estimated that the irrigation potential of the state is only 3.35 lakh hectares which is 57.5 per cent of the total cultivable area. Out of the total irrigated area of 3.35 lakh hectares, 0.50 lakh hectares (14.9 per cent) can

be irrigated through major and medium irrigation projects and rest 2.85 lakh hectares (85.1 per cent) through minor irrigation schemes. The only major project in the state is Shahnahar Project in Kangra district. After its completion, the project will irrigate 15,287 hectares. Other medium sized completed projects, having Cultivable Command Area (CCA) of 11,236 hectares are as following:

- Giri Project (CCA, 5263 hects)
- Balh Valley Project (CCA, 2410 hects)
- Bhambour Sahib Phase-I Project (CCA, 923 hects); and
- Bhambur Sahib Phase-II Project (CCA, 2640 hects)

Assessed irrigation Potential and CCA created (lakh hectares) in Himachal Pradesh

1.	Total Geographical Area	55.67
2.	Net Area sown	5.83
3.	Irrigation Potential Available Major & Medium Minor Irrigation Total	 0.50 2.85 3.35
4.	CCA Created (2001-07)	16,300 hectares

Of the total irrigation potential area in the state, the net irrigated area is only about 21 per cent. Thus the balance 79 per cent potential irrigated area can be brought under irrigation through major and medium irrigation projects and minor irrigation schemes of different agencies. The tentative ratio of major and medium irrigation projects and minor irrigation schemes is about 15**:**85 respectively. The state government has approved its 8.9 per cent outlay for irrigation and flood control in its total Rs 13378 crore approved outlay for 11th Five Year Plan (2007-12). Irrigation and Flood Control is the fourth priority sector after Social Service, Transport & Communication and Agriculture in 11th Five Year Plan. In 2008-09 annual plan, this sector got 12.3 per cent of total plan outlay of Rs 2400 crore.

Water Resource and Management

The total irrigated area in Una district is 8556 hects which accounts for about 23.2 per cent of the net area sown against the state average of around 21 per cent as irrigated. The major sources of irrigation in the district include tanks, tubewells, and wells, lift irrigation, flow irrigation etc. Out of these sources, the highest area is irrigated by tubewells followed by lift irrigation.

Table-2.20
Tehsilwise Irrigated area by source of Irrigation in district Una (Hectares)

Tehsil	Net Irrigated Area (hect)	Lift		Wells		Tanks		Ponds/ Khuls		Tubewells		Others	
		N	A	N	A	N	A	N	A	N	A	N	A
Una	4729	8	1264	468	707	1041	1776	148	-	18	952	-	30
Amb	2281	19	337	22	21	190	1630	-	-	25	293	-	-
Bangana	57	2	19	5	-	9	-	-	-	5	38	-	-
Haroli	1458	-	-	98	-	402	1455	-	3	-	-	-	-
Bharwain	31	-	-	-	-	1	-	-	-	56	31	-	-
Total District	8556	29	1620	593	728	1643	4861	148	3	104	1314	-	30

Source: (i) ATMA, Una
(ii) Statistical Outline of Himachal Pradesh (2006-07)

In Himachal Pradesh out of the total irrigated area only 3.2 per cent is irrigated by canals, 14.8 per cent by wells and tube wells and 81.8 per cent by other sources which include koohls, ponds, lift etc. in Una district, out of total irrigated area, around 57 per cent is irrigated by tanks, 19 per cent by lift irrigation schemes, 15 per cent by tube wells and 9 per cent by wells. The data show that the major area under irrigation is in Una tehsil followed by Amb and Haroli, Bharwain tehsils/sub-tehsils and Bangana sub tehsil has the least irrigated area. Map-2.13 shows the distribution of villages where more than 50 % of the net sown area is irrigated. Most such villages are located in the plain valley section of the district.

The following minor schemes will further provide irrigation facilities in district Una.

Sr No.	Name of the Scheme	Reported CCA in (upto 2008)
1	Tubewell at Bhaira	12
2	Tubewell at Diara	32
3	Tubewells in villageNandpr, Thathal, Behar, Jagwan, Katour Kalam Panjoa, Ladholi, Kuthiari (7 Nos)	244
4	Tubewells in Katour Khurd, Kuthua Kheria, Sathothar, amb Mubarikpur (7 nos)	280
5	Tubewells in Bhaira, Diara, Dilwan, Hamboli, Churry, Takarla (7 Nos)	224
6	Tubewells Amb, Chamiari, Upper Andoura and Andona (4 Nos)	124
7	Behar, Jaswan (Kashi), Behar Jaswan (Chak Bela), Takarla and Takarla (Kabir Panthi) (4 Nos)	105
8	Tubewells (71-80) at Gagret area with PR-ii	126
9	Tubewell at Gannu Mandwara	32
10	Tubewells Nakrih, Abhepur, Sanghnai, Dangoh, Pirthipur, Deoli, Chalet, Bhaderkali, Dathwara, Moh, Marwari (7 Nos)	225
11	Tubewells at Nakroh, Kaloh, Badoh, Kutherata, Jaswalan, Mundwara, Ghanari, Mawa Siudirour, Loharli, Gugger Wali Bhanjal (6 Nos)	225
	Total	**1629**

Water is also critical for rain-fed and unirrigated land which accounts for 79 per cent of the net sown area. Watershed management; rain water harvesting and ground water recharge can help augment water availability in ran-fed areas. Participatory Irrigation Management (PIM) by water users Associations would help to maintain field channels, expand irrigated area.

Irrigation Gaps in Una

The irrigation system in the district has the following major gaps:

- only one-fifth area is irrigated;
- inadequate supply of water; and
- deep aquifer and rapidly depleting water table.

Improving the water use efficiency

The departments of agriculture, horticulture and soil conservation shall have to educate the farmers about the methods, which can be adopted for using water efficiently.

2.3 Development Vision and Strategy

Vision of development of a region is a very convincing and inspiring picture of a desired development which is achievable over a set period of time. It flows from the collective aspirations of all the stakeholders of the area. The present document systematically deals with the issues and areas that require priority in accelerating the process of agricultural development in Una district over a longer period of time, say upto the end of the XIII Five Year Plan in 2022.

Vision 2022

Since nearly two thirds of workforce in Una district still depends upon agriculture, the main aim of this vision is to increase production and productivity of agriculture and allied sectors so that income of farmers, especially those of small and marginal, could be enhanced. For that, appropriate strategies have to be formulated and suitable technologies have to be developed/adopted to overcome the hurdles in the path of progress and exploitation of the potential of the area. To fulfill the dreams of the people and meet their aspirations and goals, which are reasonable and achievable need to be set, and than an appropriate plan of action have to be prepared.

The vision for the land based economy of Una district has to be in conformity with the vision for the comprehensive development of Himachal Pradesh, particularly for its lower hill tracts. The endeavour of such a vision should be to take the district towards self reliance, full employment and enhanced quality of life for its people, particularly the vulnerable and marginalized. It should follow a development model which is sustainable, eco-friendly, and makes the best use of the traditional as well as modern knowledge, practices and technologies.

District Una is one of the major food-grains producing areas of Himachal Pradesh. Wheat and maize are the main food crops of the district which are grown on about 46 % and 43 % of the total cropped area of the district respectively. The district accounts for about 10-12 % of the total production of these crops in the state. Should the district continue as the food grain producing area of the state or should it diversify its cropping pattern is the most pertinent question which must be answered before formulating any plan for agricultural development in the district. Keeping in view the food security of the country in general and of the state in particular, one may recommend that the district should continue its focus on the production of food grains. But keeping in view the harmful impact of monoculture of wheat during rabi and maize during kharif, and limited scope for the enhancement of income of farmers, one would be tempted to recommend crop diversification. The choice, in either way, is not that easy. Each option has its own pros and cons.

Keeping in view the points raised above the vision and the value statements for the land based sector of economy of district Una could be as under:

Vision Statement

By 2022, district Una will emerge as an ideal model for agri-livestock husbandry development in low hills Shiwalik environment, which is sustainable, eco-friendly and makes the best use of the local resource base by integrating traditional knowledge, practices and technologies with the modern ones. Although the district will continue to be an important food-grains producing area of the state, significant diversification in cropping pattern will take place. Area under fruits, vegetables, aromatic and medicinal plants will increase very significantly. Productivity of milch animals will also increase. The district will also emerge as an important area of organic farming.

Value Statement

The land based occupations in district Una will experience significant qualitative as well as quantitative change. Though the proportion of agricultural workers in the total workers will decline, the productivity of agricultural workers will increase. Farm mechanization, use of HYV seeds, fertilizers and IPM techniques will increase. There will be improvement in post-harvest operations, particularly marketing and value addition. All these changes along with certain changes in the allied sectors will significantly enhance the income of farmers.

In order to realize the aims and objectives of the vision 2022 pointed out in the vision statement and the value statement above, appropriate strategies have to be formulated. For that understanding of the present situation and future prospects is a must.

Present status

- Precipitation is not well distributed over the year. More than three fourths of the total precipitation is received during monsoon season (mid June to mid September)
- Frost is common during winter
- Only about 24 % of the total geographical area of the district is available for cultivation
- Only about 23 % of the net sown area is irrigated
- In most of the district soil structure is poor and soil texture is course. Such soils cannot retain moisture and plant nutrients for long. Thus their fertility is low.
- Because of steep slopes in the hills and fairly high gradient (10 m in a kilometer) in the plain valley sections, the problem of soil erosion in the district is very high
- About 84.5 % of operational land holdings are marginal (less than 1 hect.) or small (1-2 hect.) in size

- Because of small land holdings, farm mechanization level is very low
- Adoption level of modern farming methods and technologies is low
- Use of HYV of seed, particularly in case of maize and paddy is low
- Agricultural markets are not properly developed
- Most milch animals are of poor quality breeds
- Credit facilities are inadequate

These are some of the road blocks in the development of agriculture and allied sectors in district Una. However there are some positive features which hold promise for the development of agriculture and livestock in the district such as:

- Variation in altitude ranging from 350 m to over 900 m which is responsible for micro-climatic variation within the district, promote cultivation of a large variety of crops, vegetables, fruits, aromatic and medicinal plants. It also adds to the bio-diversity in natural vegetation of the region.
- Fairly good amount of rainfall which facilitates cultivation even under unirrigated conditions. Despite the fact that only 23 % of the net sown area has irrigation facility, cropping intensity in the district is 193 per cent.
- Except for a very short spell in winter, temperature in the district remains suitable for plant growth for almost whole of the year.
- Well drained soils of the district are conducive for the cultivation of most crop, vegetables, fruits, aromatic and medicinal plants.
- There is a great scope for bringing more area under cultivation. About 3.8 % of the land of the district is lying as fallow and about 3.9 % as cultivable waste land. These lands can be brought under cultivation by putting in some effort.
- The district holds a very high potential for rain water harvesting. If this potential is tapped properly, it can transform the agricultural scenario in the district.
- Since productivity level of most crops, fruit trees and milch animals is much below their potential, there is ample scope for enhancement of production and productivity of land and livestock by adopting HYV of seeds, better management of soil health and water resources, bringing more area under cultivation, use of improved agronomic practices and modern agricultural machinery, genetic improvement of livestock, better health care of the livestock, etc.

Strategies

To realize the aims and objectives of the vision 2022, the following strategies can be followed:

- **Improving the soil health and efficient use of inputs.** This will need strengthening the institutions like soil and water testing labs, micro-nutrient testing labs etc. and distributing leaf colour charts for efficient Integrated Nutrients Management for improving the soil health.

- **Improving the water use efficiency and saving the water resources**. For this, use of laser land leveling, using tensiometers for irrigation scheduling, encouraging drip irrigation in high value crops, improving recharging systems, constructing water harvesting structures and efficient delivery systems of surface water irrigation are recommended.
- **Institutional strengthening for improving the technology adoption and cut down farmers' costs** has been emphasized in the plan. Along with the strengthening of the cooperatives, improvement in the working of self help groups, village knowledge centres and farmers training centre has been proposed.
- **The need for seed production, seed replacement and seed treatment** has been emphasized and for that the strengthening of the State Seeds Corporation and State Seed Production Farms has been recommended. In addition to that setting up of a state-of-the-art biotechnology centre, a pesticide residue testing lab, the centre for marketing intelligence and a co-coordinating centre for activities to improve the productivity capacity of the small and marginal farmers, etc. at the state level have been recommended.
- The plan also has some **area specific proposals** out of which Integrated Pest Management (IPM) especially for paddy and wheat crops, horticulture and vegetables; bee keeping, mushroom cultivation, mass campaigns for educating people about weed control, Integrated Nutrient Management (INM), laser leveling, resource conservation technologies are relevant for the Una district.
- Una has a big scope for the **promotion of cultivation of fruits, vegetables, flowers, spices, aromatic and medicinal plants** under National Horticulture Mission (NHM) through State Horticulture Technology Mission (HTM) and for that it provides various kinds of incentives.
- The district has a big scope for the **promotion of wheat cultivation** under National Food Security Mission, and can get certified seed on subsidized rates, mini kits of wheat seed free of cost and some other incentives from the NFSM.
- **Continuous improvement in technologies** has been viewed as essential and for that adequate funding to Himachal Agricultural University and Veterinary and Animal Sciences department has been recommended for developing their research capacity, particularly in new areas of biotechnologies.
- To improve the lot of small and marginal farmers, important **high income alternatives** such as commercial dairy, poultry and cultivation of vegetables and fruits has been suggested and incentives for setting net-houses, modern dairy sheds for 5 to 10 milch animals and poultry sheds have been proposed. HTM also provides incentives for the cultivation of fruits and vegetables in the district.
- For the development of livestock sector **genetic upgradation of animals, institutional strengthening to improve the veterinary and health care, fodder**

development for better feeding and an increase in the proportion of **commercial farms** have been recommended.

- **Promoting improved animal farms** for meat and backyard poultry units to improve the nutritional status of small and marginal farmers and agricultural labourers have also been recommended in the plan.
- To promote milk production in the district, **herd registration** to create and maintain reliable database of pedigree and productivity of high yielding milch animals,, dairy education and training, encouraging the setting up of the commercial dairy farming units, **promoting clean and quality milk** through supply **bulk milk coolers**, incentives for establishing **mini-milk processing units** at the dairy farm level and establishing one **mobile lab** in the district for **effective quality control** on feed and milk have been recommended.
- For the promotion of fishery **strengthening of the fish seed farms**, setting up of one model fish pond/farm in each block, use of village ponds for fish cultivation after renovation and incentives to farmers for fish cultivation have been recommended.
- The plan emphasizes the need for **modernization/strengthening of agricultural markets**. For that making of market yards pucca, provision for adequate parking space, adequate number of cover sheds, provision of modern facilities like grading lines, electronic display boards, electronic scales, installation of mechanical and bulk handling units have been recommended.

Finally, the plan has proposed for **improvement in the institutional credit**. It is recommended that these institutions should simplify their procedures and credit must grow at a rate of more than 25 per cent annually.

The plan emphasizes the need for strengthening of rain-fed farming system. The resource-poor farmers in the rain-fed ecosystem practice less intensive agriculture and since their income depends on local agriculture, they benefit little from increased food production in irrigated areas. Watershed development for raising yields of rain-fed crops should be the major plank for the development of rain-fed areas. Farming system research to develop location specific technologies must be intensified in the rain fed areas. Watershed management, rain water harvesting and ground water recharging can help augment water availability in rain fed areas. Micro-irrigation is also important to improve water use efficiency in areas where water availability is limited.

Post harvest losses generally range from 5 to 10 per cent for non perishable and about 25 to 30 per cent for perishable crops. Emphasis should be given to develop post-harvest handling, agro-processing and value additional technologies not only to prevent the high losses but also to improve quality through proper storage, packing, handling and

transportation. Cost effectiveness in production and post-harvest handling through the application of latest technologies is a necessity. The agro-processing facilities should be preferably be located within the district, which may promote off-farm employment.

Recognizing this fact that more than ninety per cent population of the district lives in rural areas and the agricultural growth will continue to be the engine of the broad-based economic growth, rural development and natural resource conservation, there is a need to make higher investment through public and private sectors for the promotion of infrastructure required for agriculture development. The available funds, under different central and state schemes especially NREGS, PGSY and Bharat Nirman should be utilized for infrastructure development and generation of employment in non-farm activities. Besides this, infrastructure investments in irrigation, transport and market infrastructure development are equally important for accelerating the process of agriculture development.

Chapter-III
SWOT Analysis of the District

3.1 Introduction

Any exercise in spatial planning, whether for a micro region or a macro region, requires proper understanding of the problems and potential of that area. The SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis helps in understanding the problems and potentials of concerned area. The Agricultural Planning Unit has followed the SWOT analysis as the central tool for developing perspective document across different sectors. Strengths have been used as indicators/bases for development while the weaknesses have been viewed as the absence of certain strengths. The external environment may provide opportunities for growth or pose a threat to the development process. It is in this context that the SWOT analysis of Una district has been done.

3.2 SWOT Analysis of the district

The SWOT analysis of Una district for the development of agriculture and allied sectors has been done separately for each sector, which is as follows:

a) Agriculture

Agriculture here is used in a narrow sense that is, cultivation of crops other then fruits, vegetables, flowers, mushrooms, aromatic and medicinal plants.

Strength

- Micro climatic variations within the district which are associated with variations in elevation ranging from about 350 m to more than 900 m promote cultivation of a large variety of crops, vegetables, fruits, aromatic and medicinal plants.
- Temperatures in the district remain conducive for seed germination and plant growth for most part of the year.
- This area receives fairly good amount of rainfalls (generally over 1000 mm) which facilitate cultivation of large area even under unirrigated conditions. This is why the district has a cropping intensity of 193 per cent despite the fact that only about 23 % of the net sown area has irrigation facility.
- The well drained soils of the district are suitable for the cultivation of most crops.
- Bio-mass and animal dung is available in abundance in the district which contributes significantly to the restoration of soil health.
- HYV seed of wheat is used by most farmers and of other crops by large number of farmers.
- There is no overuse of chemical fertilizers and pesticides.

- Easy accessibility of the district to certain towns in Punjab like Hoshiarpur, Nangal etc provides good opportunities to the farmers of the district to market their produce in these markets.
- Some of the agricultural products of this district such as local varieties of maize, jaggery etc, because of their superior quality, have good demand in Punjab and command higher prices in the market.
- Soil testing facility and help from the Department of Agriculture and KVK is readily available to farmer.
- Most inputs like HYV/hybrid seeds, fertilizers etc are available locally.

Weaknesses

- Because of hilly terrain only about 24 % of the total area of the district is available for cultivation
- Only about 23 % of the net sown area has irrigation facility. Thus farming in the district is highly dependent on rainfall.
- Very low temperatures during winter, particularly from mid December to January end are not conducive for seed germination and growth of many plants.
- Ground frost is common in the district during winter which is very harmful for the standing crops.
- Rainfall is not well distributed over the different months in a year. More than three fourths of the total rain in a year is received during the monsoons (mid June to mid September). Rainfall is scanty during rest of the year.
- Soil structure is poor and soil texture is course. Such soils cannot retain moisture and plant nutrients for long and thus require frequent watering and replenishment of soil nutrients.
- Because of steep slopes, undulating topography and course soil texture soil erosion is very high in the district.
- Most agricultural land in the district requires land leveling. In certain areas even the leveled lands extensively lose its levelness after a few years because of extensive soil erosion.
- Fields in the vast tract along river Soan as well as along many other seasonal streams experience crop damage, soil erosion and deposition of silt due to flooding during rainy season.
- Operational land holdings are small. Average operational land holding size of the district is only 1.3 hectares. Marginal and small landholdings account for about 84.5 per cent of the total land holdings in the district.
- Because of small size of operational land holdings the level of farm mechanization in the district is low.
- The use of HYV seeds in crops other than wheat is low.
- Use of chemical fertilizers, pesticides, soil micro-nutrients etc is low.

- Since more than three fourths of the net sown area has no facility for irrigation, use of HYV seeds and fertilizers etc is limited.
- Because of the reasons stated above yield of most crops in the district is much lower than Punjab and Haryana.
- Agricultural markets in the district are not fully developed and they lack basic infrastructure and other facilities.
- Facilities for value addition in the agricultural produce in the district are limited.

Opportunities

- Topographic and micro-climatic variations within the district permits, cultivation of a vast variety of crops.
- There are ample opportunities for the expansion of cultivated area in the district. About 12,000 hectares of cultivable waste land and fallow land, which is about one third the size of the net sown area, is available in the district. This land can be brought under cultivation by putting in some effort.
- Since there is a limited use of chemical fertilizers and pesticides, there is a good scope for the promotion of organic farming in the district.
- The district has a very high potential for rainwater harvesting. The harvested water can be used for bringing more area under irrigation to enhance agricultural production.
- The water use efficiency in the district can be enhanced by undertaking
    - Land leveling
    - Use of underground pipes for water delivery system
    - Use of sprinklers/drip irrigation system
    - Use of tensiometers for regulating irrigation regime in paddy fields
    - Sowing of wheat on raised beds
    - Sowing of maize and certain other crops on ridges
- Productivity of most crops can be enhanced by:
    - Using HYV/improved seeds on more area
    - Seed replacement in a cycle of three to four years
    - Seed treatment before sowing every year
    - Use of chemical fertilizers, organic manure, IPM and by adopting other modern techniques of farming as recommended by the agricultural scientists
- Initiation of soil and water management programmes on watershed basis can transform the agriculture in the district
- Channelisation of river Soan and certain other seasonal streams can not only save the area from the problems of soil erosion, flooding and siltation, but can also help in the reclamation of sizeable land for cultivation.

Threats

- Floods, soil erosion and siltation are very serious problems of the district
- Since cultivation on more than three fourths of the net sown area in the district is dependent on rains, risk of crop failure due to failure of rains is very high
- During winter frost is very common which is very harmful for the crops
- Threat to standing crops from the stray and wild animals is very high
- Local varieties of maize and certain other crops which are superior in taste but have low yield may become extinct due to adoption of HYV/hybrid seeds.

(b) Horticulture

Horticulture includes cultivation of fruits, vegetables, spices, aromatic & medicinal plants, flowers and mushrooms. SWOT analyses of each of these have been provided below separately.

(i) Cultivation of fruits

Fruits are cultivated on about 5000 hectares of area in Una district which is about 2.6 % of the geographical area of the district and is equivalent to about 13.5 % of the net sown area of the district. Although a large variety of fruits are grown in the district mango and citrus (Kinnow, orange, malta, lime and galgal) account for about two thirds of the total area under fruits. There is also considerable area (750 ha) under pears. Other fruits which are grown over an area of more than 100 hectare each are guava, litchi, aonla and stone fruits.

Strength

- Agro climatic conditions in the district are suitable for the cultivation of a large variety of fruits in the district
- The district is a major mango (desi variety) producing area of the state. Mangoes of this area are most suitable for pickle making
- Low temperature during winter which make the deciduous fruit plants dormant facilitate pruning and training of these plants which is very essential for regulated growth of plants and fruit bearing.
- The old desi mango trees can survive under rainfed conditions
- Assistance from horticulture department is readily available
- The district is covered under Horticulture Technology Mission/National Horticulture Mission. A variety of incentives are provided to the farmers for the promotion of fruit cultivation
- Fruit cultivation is possible even on these lands in the district, where, because of steep slope or other reasons, crop cultivation is not possible or is uneconomical

Weaknesses

- Frost during winter is harmful for many young fruit plants. Frost can also adversely effect certain fruits like papaya and kinnow also.

- Drought or delay in rains can adversely effect production of mango, pears and certain other fruits. On the other hand untimely and heavy rains are harmful for grapes, litchi and many other fruits
- Limited irrigation facility is a major road block in the expansion of area under fruit cultivation
- Because of small land holdings most farmers practice subsistence type of farming. They are reluctant to divert their land from crop or vegetable cultivation to fruit cultivation
- Fruit bearing on alternate years in case of mango, particularly desi mango discourages farmers to go for mango plantations.
- Farmers lack knowledge about the modern horticulture practices about different fruits
- Because of inadequate use of inputs like manure, fertilizers and micronutrients and poor management techniques, productivity of fruits trees is low
- Farmers generally lack knowledge about cleaning, grading and packing of fruit
- Marketing facilitates for fruits in the district are inadequate
- There are just a few fruit processing unit in the district
- Risk of crop failure and price fluctuations are much higher as compared to cereals, pulses, oil seeds and cash crops.

Opportunities

- Some sucking varieties of desi mango are so good that people prefer those over the grafted varieties like Dusheri, Langra, Chausa etc. and these varieties command higher prices than the grafted varieties. Similarly desi varieties of mango are considered better than the grafted varieties for pickle making. Thus there is a need to preserve and propagate good varieties of desi mango.
- Vast variety in agro-climate conditions within the district allows cultivation of a large variety of fruits including walnut, almond, olive, grapes, papaya, plums, pear, peach etc.
- There is a need to educate small and marginal farmers that they can earn more by adopting fruit cultivation
- It is possible to increase area under fruit cultivation. Reasonable targets which are achievable may be fixed.
- There is a need to educate farmers about the proper horticulture practices about each fruit so that their returns from fruit cultivation increase significantly.
- Farmers also need to be educated about post harvest practices to reduce post-harvest losses
- Fruit processing industry has to be promoted in the district for value addition
- Facilities to provide quality planting material to the farmers should be improved

- Farmers need to be made aware about the incentives provided under various schemes

Threats

- If not preserved, indigenous varieties of mango may become extinct in the district.
- Plants and fruits face real threat from stray and wild animals and birds

(ii) Vegetable Cultivation

Strength

- Vegetables are grown on about 1.9 % of the total cropped area of the district, which is a fairly good proportion. Keeping in view that only about 23 % of the net sown area has irrigation facility.
- Potato cultivation account for about 39 % of the total area under vegetable.
- Climatic conditions in the district allow cultivation of vegetables throughout the year.
- Soils in the entire district are suitable for vegetable cultivation
- The district has easy access to vegetable markets in Punjab and Chandigarh
- Improved seeds, fertilizers, pesticides and other inputs are available locally.
- Vegetable cultivation is mostly associated with certain communities which are traditionally known as vegetable growers. Una district has the presence of some such communities which is to the advantage of the district. Apart from these some migrant vegetable growers from Uttar Pradesh also come to the district every year. They grow spring vegetables in the dry bed of river Swan.

Weaknesses

- Frost in winter is harmful for potato and certain other vegetable crops
- Lack of assured irrigation facility is a great hindrance in the expansion of area under vegetables.
- Some vegetables require daily or more frequent harvesting/plucking and marketing. Many farmers find that too cumbersome and time consuming and thus, for those reasons, are unwilling to take up vegetable cultivation.
- Since quality seeds of vegetables are expensive, most farmers use sub-standard vegetable seeds
- Demand for vegetables within the district is limited
- In the absence of sizeable vegetable markets in the district farmers have to market their produce mainly in the vegetable market of Punjab and Chandigarh. Many small farmers cannot afford long distance marketing for their produce, particularly those vegetables which have short shelf life.
- Post harvest losses are quite high because farmers lack knowledge about cleaning, grading, packing and there is absence of processing facility within the district

Opportunities

- Since shifting from crop cultivation to vegetable cultivation and vegetable cultivation to crop cultivation is possible without any inconvenience and vegetable cultivation can also be adjusted into crop rotation with many crops, it is far more easier to convince the farmers to adopt vegetable cultivation
- To promote vegetable cultivation in the district more area have to be brought under irrigation
- Drip/sprinkler system of irrigation should be promoted in the district to promote vegetable cultivation
- Those farmers who are unwilling to take up vegetable farming because they find daily/more frequent plucking/harvesting and marketing of vegetables cumbersome be motivated to take up cultivation of those vegetables which have long shelf life and can be harvested and marketed like other crops in a single go like potato, onion etc.
- Cultivation of exotic and off season vegetables can be promoted under controlled conditions, such as, in green houses/shade net houses, under low plastic tunnel etc.
- Marketing and storage infrastructure in the district has to be strengthened/improved
- To reduce post-harvest losses farmers have to be educated about post harvest technologies and practices such as cleaning, grading, packing and storage and processing facilities have to be created within the district
- For higher profits Delhi market and other distant markets have to be explored
- Farmers should be advised to use vegetable seeds of superior quality and these seeds should be made available in the district at reasonable rates.

Threats

Farmers may suffer losses due to spurious vegetable seeds supplied to them.

- Most vegetables are prone to pest attacks. If pest attacks are not controlled effectively, it can result in heavy losses to the farmers.
- Because of no control on the prices of the vegetables, the threat of uncertainty always looms on the head of the farmers
- Since vegetable cultivation often require comparatively more investment on inputs like seed, fertilizers, manure, pesticides, labour etc. crop failure due to any natural or man made reasons can ruin the farmer financially
- Excessive use of chemical fertilizers and pesticides can palute soil, ground water and air.

(iii) Cultivation of Spices, Aromatic and Medicinal Plants

Cultivation of ginger, garlic, turmeric, karnauli (ajwain), mentha, ashwagandha and certain other plants is covered under spices, aromatic and medicinal plants.

Strength

- Agro-climatic conditions in the district are favourable for the cultivation of various spices, aromatic and medicinal plants
- Ginger and garlic is already cultivated in the district and farmers are familier with the agronomic practices required for the cultivation of these crops
- Returns from the cultivation of spices, aromatic and medicinal plants per unit of area are comparatively high
- There is a ready market for these products
- Some of these crops can be cultivated even as inter-crop with orchards, tree plantations and other crops
- Cultivation of certain medicinal plants, particularly those which face the threat of extinction due to uncontrolled collection from their natural habitat, can save them from extinction
- Standardisation and quality control of cultivated spices, aromatic and medicinal plants is possible

Weaknesses

- Apart from the cultivation of ginger, garlic and turmeric farmers are not familiar with the cultivation practices of most spices, aromatic and medicinal plants
- Our knowledge about the most suitable agro-climatic conditions for various spices, aromatic and medicinal plants is limited
- Economics of cultivation of most of these crops is also not known
- Cultivation methods of most spices, aromatic and medicinal plants are yet to be perfected
- Marketing of these crops is unorganized which leads to eating up of profit by the middle man

Opportunities

- Because of vast agro-ecological variations in Una a large variety of spices, aromatic and medicinal plants can be cultivated in the district
- Research is needed to find out the most suitable agro-ecological situation for different spices, aromatic and medicinal plants
- Research is also needed to perfect the cultivation methods for each type of spices, aromatic and medicinal plants
- Farmers have to be educated about every aspect of cultivation of these crops/plants
- To save the farmers from being fleeced by the middleman marketing of these products have to be regulated
- Farmers must be informed about the various incentives provided under NHM for the cultivation of these crops/plants

Threats

- Cultivation of these crops without proper understanding of the agro-ecological requirements of these crops, appropriate agronomic practices required in each case and most importantly the economics of cultivation of these crops can lead to disastrous results

(iv) Floriculture

Strength

- National Horticulture Mission (NHM) provide incentives for the cultivation of cut flowers, bulbous and loose flowers
- There are number of religious places within the district as well as in the adjoining districts where there is a large demand for marigold flowers
- The enterprising farmers can tap distance markets like Chandigarh, Delhi, Ludhiana, and marriage palaces and hotels at various places for the sale of cut and bulbous flowers
- Cultivation of marigold can be taken up by any farmer as it does not require any special skill for cultivation. It can be grown on almost all type of soils. It require very small investment and return are fairly good

Weaknesses

- Cultivation of cut flowers and bulbous flowers require very heavy investment and higher degree of skill for their cultivation
- There is hardly any market for cut and bulbous flowers within the district
- In the absence of any international airport nearby, cultivation of flowers cannot be undertaken for foreign markets
- Flowers are very delicate products. They cannot withstand the vagaries of climate. Strong wind, frost, hails, heat wave etc. can ruin the flowers as well as flower beds
- Flowers are cultivated only on about 30 hectares of land to meet mostly the local demand. Cultivation of flowers on commercial scale is yet to be taken up in the district

Opportunities

- Despite suitable agro-ecological conditions opportunities for the development of floriculture in the district are limited because there is no market for the flowers within the district or nearby. But for those farmers who are educated enterprising have enough resources at their command and who can undertake marketing of their produce, there are ample opportunities to take up floriculture on commercial lines

Threats

- Frost, hail, heat wave, untimely rains etc are the main threats to the cultivation of flowers

- Stray animals and wild animals can also damage the flower beds

(v) Mushroom cultivation

Strength

- Its cultivation suits small, marginal and even landless farmers, unemployed youth and women
- Its cultivation during winter can be started with a small investment
- Training facility for its cultivation is available at KVK, Una

Weaknesses

- Local market for mushroom consumption is too small to support large scale production of mushrooms in the district
- Summer temperature in the district is too high for mushroom cultivation under natural conditions. Therefore air-conditioning is required for cultivation of mushroom during summer, which is not economical
- Mushrooms have a very short shelf life, therefore its marketing is a big problem

Opportunities

- Since most farmers in the district are having small or marginal land holdings, they can take up mushroom cultivation during winter under natural condition to augment their income
- Mushroom growers can form a cooperative society for the marketing of their produce in the markets of Delhi, Chandigarh and other distant places

Threats

- Except for problems of marketing, there is no other serious threat faced by the mushroom cultivation in the district

(c) Animal Husbandry and Dairy Development

Strength

- As per livestock census 2003, the district has over 2 lakh livestock. Which provide milk, meat, egg and draught power. In addition to that their dung and urine is used as manure to restore the fertility of soil. Dung is also partially used after drying as fuel in homes for cooking
- About 26400 hectares of land which is about 17 % of the total geographical area of the district is under permanent pastures, grazing lands and cultivable waste. This land is available for livestock grazing and grass production. In addition to that fodder is also produced on about 2 % the total cultivated land. Residue of certain crops is also used as fodder. Thus the district has sufficient land for grazing of

animals and production of grasses. In addition to that other sources of fodder are also available to the farmers

- There are 129 veterinary institutions in the district to look after the health and reproduction needs of the livestock. These institutes include 18 Veterinary Hospitals, 1 Central Veterinary Dispensary and 1 Government Poultry Farm
- There are 2 Senior Veterinary Officers, 19 Veterinary Officers, 2 Chief Veterinary Pharmacists, 16 Animal Husbandry Assistants and 130 Veterinary Pharmacists in the district to provide veterinary services
- The Department of Animal Husbandry and Department of Dairy Development run number of schemes for the betterment of livestock health, breed upgradation, setting up of dairies, etc.
- Some farmers have joined the Milk Cooperative for the marketing of their produce

Weaknesses

- Most animals are of poor quality breeds
- Despite large area for grazing and grass production the area often experience shortage of fodder which is met from outside the district
- Productivity of milch animal is low
- The number of high milk yielding cross breed cows is not very large
- The main milch animal of the district is buffalo which generally has low productivity level
- Quality feed, fodder and nutrients are generally not provided to the milch animals
- Most milch animals suffer from low input/output syndrome
- Animal health care and management at the farmers level is poor
- Most farmers are unaware about the modern animal health care and management techniques
- Infrastructure for the sale of animal products in the district is not fully developed

Opportunities

- There is a lot of scope for the development of livestock sector, particularly dairy sector in the district
- Breed improvement programmes in the district must be strengthened
- To promote milk production in the district training and awakening programmes with regard to animal health care, animal diet and general management should be organized for the farmers
- Commercial dairy with ten or more milch animals, preferably CBC, should be promoted in the district
- The district has good potential for the development of goat and sheep for meat and wool production. This potential must be exploited for the benefit of economically weaker sections of the society

- Economically unproductive animals should be gradually replaced by more productive animals
- Milk procurement system has lot of scope for improvement

Threats

- The growth of animals having low productivity become a major threat to the economy of the district
- The unchecked growth of unproductive animals is adding to the population of stray animals which are causing a lot of damage to the standing crops
- If the productivity of milch animals is not improved significantly, it may result in the total collapse of the dairy sector
- The low fertility among cows, especially among cross-breed cows is another serious threat for the dairy sector
- The male calves of C.B. cows have no utility. Thus they are a burden on the dairy farmers

(d) Fisheries

Strength

- In addition to the considerable area of Gobindsagar which falls in the Una district, there are large number of water bodies in the form of village ponds, private ponds, community ponds, check dams having an area of about 250 hectares which is available for aquaculture in the district. In fact out of these 250 hectares, an area of about 100 hectares is already being used for aquaculture
- Agro-ecological situations in the district is favourable for aquaculture
- Department of Fisheries and Fish Farming Development Agency are running number of centrally sponsored and state sponsored schemes and training programmes for the development of aquaculture in the district
- Guidance and assistance in various forms from the department of Fisheries is available to fish farmers
- The department has its own fish seed farm in the district to supply fish seed to the farmers and for release into Gobindsagar, Pong Dam and other reservoirs

Weaknesses

- Since fish farming is not recognized as agro-allied activity by the state electricity board, fish farmers have to pay electricity charges on commercial rates
- The department does not have its own aqua-clinic for soil and water testing and for disease diagnosis
- The department has shortage of extension staff

- The fish farmers often face the problem of non availability of quality fish seed, feed, growth hormones etc
- Non-availability of vehicle with the department at the district level constrains the extension work of the department
- The district lacks modern fish market and debonning plant for producing fish items for value addition

Opportunities

- Water bodies with an area of about 150 hectares are available in the district which can be utilized for the development of fisheries
- With the completion of channelisation of river Swan a large amount of land will be reclaimed. Part of this land can be earmarked for the construction of fish ponds
- The projects taken by the department for the development of cat Fish Culture and Fresh Water Pearl Culture are expected to transform the aquaculture in the district
- There is a need for modern A.C. Fish market in the district
- There is a need for installing a fish de-bonning plant in the district to produce ready to eat fish products and canning of fish

Threat

- The department plans to promote Cat Fish Culture including Magur fish. Culture of Magur fish is banned in many states because it is a predator. Its promotion in the district can threaten the existence of other species of fish in the ponds and reservoirs. Consumption of Magur fish is also considered unsafe for human health.
- A migratory bird which can dive deep into water to catch fish has started visiting north west India especially Punjab and Haryana, from the last few years. These birds survive mainly on fish and can consume upto half a kg of fish per day. These birds form colonies near the fish ponds and it is very difficult to protect the fish in the ponds from the attack of these predators. Fish farmers in Punjab and Haryana suffered big losses due to the visit of these birds. District Una is not out of reach of these predators.
- Theft of fish from private and community ponds and illegal catching of fish from Gobindsagar and other reservoirs are not uncommon.
- Entry of industrial plutents into streams, reservoirs and fish ponds can kill the fish in no time.

3.3. Accommodating SWOT

3.3.1 Emerging issues and suggestive solutions

Emerging Issues	Suggestive solutions
Natural Resources	
Degradation of soil fertility and health	Popularization of IPM and INM techniques
Development of saline sodic patches	Popularization of Gypsum
Farming systems	
More dependency on migrant/external labours	Promotion of work culture among the youth of farming households, popularization of labour saving techniques
More dependency on non formal financial institutions like commission agents for finance	Strengthening of primary agriculture cooperative societies and more agriculture credit through commercial banks
Low level of scientific knowledge and skills among farming community	Training and education on scientific techniques and modern/new skills
Unorganized and individualistic approach towards farming	Formation of farming groups, popularization of cooperative farming
New generation of farming community is not showing interest in the farming	Popularization of profitable agriculture crops and allied activities
Nutritional imbalance in soil	Promotion of Integrated Nutrients Management (INM)
Increasing problem of weeds	Proper and timely weed management through on farm training about different herbicides
Degradation of soil fertility due to non application of green manuring/organic matter and imbalanced use of plant nutrients	Popularization of green manuring and organic farming, promotion of balanced use of fertilizers
Knowledge gap of IPM technology particularly in the use of Bio pesticides and Eco-friendly pesticides	Imparting knowledge about pests and adequate use of pest management practices focusing on bio-pesticides and eco friendly pesticides
Low replacement rate of certified seeds	Popularization of certified seeds through literature, demonstrations and exposure visits
Non use of micronutrients	Promotion of Integrated Nutrients Management Techniques
Lack of seed treatment in major crops	Popularization of seed treatment techniques through demonstrations and training
Non availability of crop loan in time	Strengthening of formal financial institutions i.e. cooperative societies, commercial banks
Very less linkages of credit with agri-inputs	Creation of credit linkages with agri-input through cooperative societies
Low yield of pulses and oilseeds	Popularization of high yielding varieties, integrated weed and pest management
Lack of monitoring cell to predict marketing situation	Promotion of marketing information system
Very less use of Information Technology	Popularization of Information Technology in Agriculture Sector
No laboratory to test organic food/produce	Establishing laboratories
Absence of commodity based farming organizations at the village level	Organizing of commodity/sector based on farming bodies
Vegetable crops	
Highly labour intensive	Popularization of labour saving mechanical techniques
Lack of market intelligence network	Better use of print and mass media to provide information about market and prices
Scattered production in unorganized manner	Strengthening of vegetables marketing under the supervision of marketing board
Lack of value addition/processing facility	Establishment of Agro processing enterprises
High production cost	Using cost saving modern techniques
More dependency on migratory labour	Promotion of work culture among the members of farming families
Horticulture	
Less availability of irrigation water	Generation of irrigation resources, promotion of drip irrigation system and other water saving irrigation techniques
Less availability of quality planting material	Improving nurseries and supply of improved cultivators

Weather climatic conditions	Promotion of drought and frost resistant techniques
Lack of knowledge about post harvest technologies	Popularization of post harvest technology
Ignorance about proper spacing, lay out training, pruning and plantation	Organization of awareness camps and demonstrations. Promotion of proper spacing during lay out time
Improper grading and packaging	Promoting technologies for grading and packaging
Less awareness about organic farming	Promotion of adequate use of organic manure
Ignorance about bio-fertilizers	Promotion of proper use of fertilizers
Lack of market intelligence communication technology	Better use of information through media and exposure to the farmers to local as well as distant market trends
Unscientific nursery raising and mortality of seedlings during off season plantation	Popularization of scientific methods of raising nursery and off season plantation under protected plantation techniques (Poly House Techniques)
Poor adoption of aromatic and medicinal plant cultivation	Promotion of adoption of suitable aromatic and medicinal plants and their marketing system
Flowers/Mushroom	
Short shelf life	Popularization of shelf life techniques to be adopted for flowers. Creation of mushroom growing chambers in the existing cold storages
Unorganized production and marketing	Creation of centralized body to provide day to day information about production and marketing
Higher intensive labour	Popularizing modern labour saving techniques
Lack of awareness and expertise about seed production	Promotion of seed production techniques through training and field demonstration
Less local demand and more dependency on distance market	Provision of better transport facilities to reach distant markets
Mushroom spawn is not readily available/produced locally	Production of mushroom spawn locally
Animal Husbandry	
Indigenous/poor milk yielding breeds of cows/buffaloes	Upgradation of local stock through Artificial Insemination
Longer inter-calving period	Reduction of inter calving period through better management practices
Lack of awareness about mineral mixtures/vitamins	Promotion of mineral mixture feeding
No deworming practices in cows and buffaloes	Popularization of deworming practices
Infertility problem	Organization of animal health camps
Unawareness regarding rearing of improved breeds	promotion of rearing improved breeds
Late maturity of she calves	Provision of balanced feeding for early maturity
Preference for natural service	Promoting Artificial Insemination
High yielding buffaloes are exported to other states	Upgradation of low yielding buffaloes through better breed and better management
Low replacement rate of unproductive animals	Creation of awareness through training and education
Low milk productivity	Better management techniques and balanced feeding
Diagnostic problems for various diseases	Promotion of diagnosis of diseases on the basis of established symptoms
Improper housing and unhygienic conditions	Popularization of proper housing and hygienic conditions
Non availability of short duration fodder varieties	Popularization of short duration fodder varieties of nutritional value
Milk rate is low	Strengthening of Cooperative Milk Societies
High rate of kid mortality in goat due to improper health management	Popularization of proper health management through training & education
Decreasing pastures and bushy shrubs	Using crop residue or horticulture residue as fodder
Low adoption of piggery, poultry and rearing goat and sheep	Creation of awareness about the profitability in the promotion of such enterprises
Fishery	
Low productivity due to unscientific pisciculture	Propagation and promotion of scientific technology through demonstration and training
Technology adoption gaps	Training and education on proper technology. Field visits
Lack of awareness about proper feeding schedule	Training is required
Non adoption of management practices viz sample netting and aeration causes low yield	Training is required
Non adoption of weed control measures	Training & Demonstrations are required
Costly feed	Promotion of cost effective fish feed formulation

Lack of awareness about fish farming	Proper transfer of technology
Short term leasing of community ponds	Panchayats should intervened for long term lease
Non adoption of proper ratio of pisciculture components	Training and education is required
Improper pond preparation	Need for Consultation with Fishery Department
Sericulture	
Inadequate availability of mulberry leaves	Promotion of large area under mulberry plantation
Non availability of High Yielding varieties	Promotion of High Yielding varieties
Lack of technical know how about cocoon production	Popularisation of scientific technologies
Marketing through unorganized sector	Marketing through organized sector
Non availability of proper rearing equipments	Ensured availability of equipments
Bee Keeping/ Mushroom Cultivation	
Limited flora available	The department should intervene
Less interest to adopt bee keeping/mushroom cultivation	Promotion of agriculture based programmes
Others	
Stray animal menace	Construction of Gaushalas as per requirements
Lack of livelihood/entrepreneur activities through SHGs/Farming Organizations/Farming interest Groups	Promotion of skill based activities
Severe infestation of Congress grass	Community campaign for its eradication
Lack of knowledge about rain water harvesting	Awareness campaign to promote water harvesting
Loss of soil health due to mono-cropping sequence	Crop diversification should be promoted

3.3.2 SWOT Matrix

The following SWOT matrix strategies may be used to speed up the development of agriculture and allied sub sectors.

(i) **Strengths – Opportunities (S-O) Strategy:** This strategy pursues opportunities that are most suitable to the strengths

(ii) **Weaknesses – Opportunities (W-O) Strategy:** This strategy overcome weaknesses to pursue opportunities

(iii) **Strengths- Threats (S-T) Strategy**: This strategy identifies ways that can be used to reduce vulnerability of external threats.

(iv) **Weaknesses – Threats (W-T) Strategy:** This strategy establishes a defence plan to prevent weaknesses for making it easily susceptible to external threats.

(i) Strength-Opportunity (S-O) Strategy

Sector	Strategy
Crop Husbandry	1. Diversification and intensification
	2. Improvement of productivity and profitability
	3. Convergence of NREGS, Bharat Nirman, PMRY, RKVY and other schemes
	4. Expansion of oilseeds, vegetables, fruit crops and medicinal plants
	5. Organic farming
	6. Increasing credit flow
	7. Human Resource Development
Soil and Water Conservation	1. Integrated Watershed Development
	2. Soil conservation measures with community participation
Animal Husbandry	1. Preservation of indigenous breeds
	2. Breed upgradation by Artificial Insemination
	3. Introduction of new breeds
	4. Fodder development
	5. Backyard poultry
	6. Value addition of animal products through processing
	7. Human Resource Development
Fishery	1. Promotion of composite pisciculture in ponds/tanks
	2.Establishment of private hatcheries
Forestry	1. Participatory forest management

(ii) Weaknesses-Opportunities (W-O) Strategy

Sector	Strategy
Crop Husbandry	1. Infrastructure Development 2. Participatory Extension 3. Increasing Seed Replacement Ratio, IPM, INM and farm mechanization 4. Participatory Irrigation Management 5. Conjunctive use of surface and ground water 6. Participatory technology development 7. Contract Farming 8. Crop Insurance
Soil and Water Conservation	1. Adoption of rain fed land technology 2. Recycling of organic farming
Animal Husbandry	1. Development of conducive infrastructure for better animal health 2. Capacity building of stakeholders 3. Support for agro-processing and value addition of animal products 4. Transport facility for liquid hydrogen and frozen semen 5. Animal insurance cover 6. Promotion of commercial dairy
Fishery	1. Pond preparation for composite pisciculture 2. Supply of fingerlings and fish seeds 3. Management of fish diseases 4. Renovation of village ponds and long term leasing 5. Decentralized production of fish seed and fingerlings 6. Promotion of trout fish

(iii) Strengths- Threats (S-T) Strategy

Sector	Strategy
Crop Husbandry	1. Post harvest technology 2. Check on transfer of agriculture lands to non-agricultural purposes 3. Micro-irrigation
Soil and Water Conservation	1. Plantation in Waste and Panchayat lands
Animal Husbandry	1. Management of milch and drought animals 2. Promotion of organized cattle fairs
Fishery	1. Promotion of organized fish market 2. Policy initiatives to check negative impact of industries on water bodies/ lakes/ rivers
Forestry	1. Participatory forest management

(iv) Weaknesses – Threats (W-T) Strategy

Sector	Strategy
Crop Husbandry	1. Promotion of IPM and INM practices through demonstration and training 2. Promotion of organic farming through group mobilization 3. Bio-diversity conservation 4. Maintenance of soil health 5. Soil testing and correction of soil problems
Soil and Water Conservation	1. Conservation of soil and water through community participation 2. Land improvement as per land capability classification
Animal Husbandry	1. Strengthening the production and input distribution system 2. Strengthening of milk co-operatives 3. Fodder development 4. Bulk/community purchase of inputs
Fishery	1. Biological control of aquatic weeds 2. Awareness of community for management of fish ponds/reservoirs/fresh water
Forestry	1. Capacity building of community

3.4 Sectoral/Regional Growth Drivers of the district

Identification of sectoral/regional growth drivers in the district has been done from two different perspectives, that is, (a) in which regions particular sub- sector of agriculture

serves as growth drivers; and (b) which sub-sectors of agriculture serve as growth drivers in different regions of the district.

(a) Sectoral Growth Drivers

Cultivation of Wheat

Wheat is the most important rabi crop of the area, and it covers 44 % of total cropped area of the district. Wheat serves as one of the most important growth drivers in the entire district. However its role becomes slightly less important in the potato growing areas and orchard areas of the district.

Cultivation of Paddy

Rice occupies only about 3% of the total cropped area in the district, but its cultivation in the district is mainly concentrated in the tehsils of Una and Amb. Rice also occupies a very small percentage of cropped area in sub tehsils of Haroli and Bangana. In these areas, the rice cultivation is an important growth driver.

Cultivation of Maize

Maize is the most important foodgrain as well as cash crop of the district and it occupies about 43% of the total cropped area of the district. Its role as a growth driver is important in all the tehsils and sub tehsils, however Amb and Una are more important.

Cultivation of minor crops

Grams, moong and other pulses, barley, oilseeds, are the other important crops of the district. Some of these are cultivated in rainfed areas and on less fertile soils and require less water and other inputs. Cultivation of these crops is serving as an important growth driver in all the tehsils.

Cultivation of fruits

Cultivation of fruits, especially Mango, Pear, Kinnow, Lemon, Guava, Litchi and Grapes, has emerged as the most important growth driver in the district. Fruits account for about 7 per cent of the total cropped area in the district. The cultivation of Mango, Litchi and Kinnow, is also likely to increase in near future.

Cultivation of vegetables

Since the vegetable cultivation requires fertile soils, sufficient water, preferably tubewell water for irrigation, manual labour, and nearness to market, it has emerged as an important growth driver in Una tehsil of the district. Its role has become more important in villages around Una- Santoshgarh which have emerged as vegetable growing areas. It has been observed that the cultivation of perishable vegetables is mainly concentrated near the urban centres but, in case of potato, onion, and some other vegetables which have longer shelf life, the distance from markets is not a major consideration.

Cultivation of mushroom, flowers, spices, aromatic and medicinal plants

Although the district has a good potential for the cultivation of mushroom, flowers, spices, aromatic and medicinal plants, yet cultivation of these is yet to pickup. Cultivation of these plants/crops is likely to emerge as an important growth driver in the next plan.

Dairy Farming

Among the allied agricultural sectors, dairy farming is the most important sector which makes notable contribution to the income of farmers. Dairy farming is practiced throughout the district. However its role as a growth driver becomes more important in the villages of Amb, Una and Gagret blocks of the district.

Rearing of goats, sheep and swines

Goats, sheep and swines are reared mainly by the weaker sections of the society. This sector especially the goat rearing serves as an important growth driver in the villages of Bangana and Haroli blocks.

Fishery

Fishery is mostly concentrated in areas of Gobind Sagar Lake falling in Una district and also in khads and ponds. Therefore, fishery sub sector serves as an important growth driver.

Poultry

The villages in Una, Haroli and Gagret have a sizeable number of poultry birds especially the backyard poultry. In these villages the poultry farming serves as an important growth driver.

Honey Bee Keeping

Bee keeping is also another subsidiary source of income for the farmers. Since bee keeping is practiced by a small number of farmers who are dispersed in the district, no specific area has emerged which could be called as honey bee region of the district. However, honey bee keeping is serving as an important growth driver.

Sericulture

Sericulture is also another subsidiary source of income for some rural households. Villages in block Amb have emerged as sericulture development areas. Sericulture is serving as an important growth driver in this pocket.

(c) Regional Growth Drivers

Growth Drivers of AES-I

Areas covered in AES-I have topography with gentle slope with mostly fine to medium grained fertile Entisols and Inceptisols soils. The soils are generally free from the problem

of salinity/alkalinity, and are suitable for the cultivation of all types of crops, vegetables and fruits. Under ground water is mostly sweet and tubewells and flow irrigation schemes water is also available in requisite quantity. As a result, considerable area of this region is under triple crop cultivation system. Paddy-potato-summer vegetables/sunflower/green fodder/spring maize crop rotation is practiced in triple cropped areas. In double cropped areas paddy-wheat crop rotation is generally practiced. Thus the cultivation of paddy, wheat, potato and other vegetables are the main growth drivers. Fishery, poultry and dairy farming are also important growth drivers of this region.

Growth Drivers of AES-II

The region has mostly Entisols and Inceptisols soils with shallow soil depth. With partial irrigation facilities, cereals, vegetables and fruit based cropping system is predominating. Of course, there are some pockets where maize/paddy and wheat rotation is practiced. The cultivation of fruits, wheat, maize and vegetables are the main growth drivers of this region. In addition, the dairy and backyard poultry are the other important growth drivers.

Growth Drivers of AES-III

Considerable area of this region has undulating topography. The soil texture varies from sandy clay loam to clay loam with good soil health. Rainfall is around 700 mm and soils are of Inceptisols type. Because of inadequate irrigation facilities, the rainfed agriculture is being done. The cereals, vegetables, fruits (mango and citrus) and especially the sugarcane cultivation are the main growth drivers of this region. Cultivation of pulses, oilseeds and rearing of goats are the other important growth drivers of this block.

Growth Drivers of AES-IV

The topography of this region is undulating (450-900 mtrs. elevation) with average rainfall between 900-1300mm. Soil erosion is the main problem. The cereals, pulses and fruits are the major rainfed crops. The region has meager irrigation facilities. Therefore, the cereals, pulses, fruits and forestry are the major growth drivers in this region. Animal husbandry, fishery, sericulture and medicinal plants are the other important growth drivers of this region.

Chapter- IV

Development of Agriculture Sector

4.1 Introduction

The economy of district Una of Himachal Pradesh is largely based on the agriculture and allied sectors. The better growth in agriculture and allied sectors symbolizes the economic development of district as well as of the state. The district's hope for sustaining its position as a front runner district in economic growth thus hinges on achieving a breakthrough in agriculture as well as successfully expanding its manufacturing and service sectors. The promotion of allied sub-sectors i.e. horticulture, dairy, fishery, bee keeping etc and agri-processing industry is also important for the district to create employment opportunities especially for the rural youth. Therefore a higher growth in the district's economy cannot be achieved or sustained on a long term basis, without good growth in agriculture, nor is it possible to reduce poverty and generate more employment without agricultural growth.

The district has significant bearing on its agricultural performance. As already mentioned, Una district has 6.8 per cent of the total net sown area (5.43 lakh hectares) of the state. The share of the district is 7.5 per cent in total cropped area (9.54 lakh hectares) of the state. Una is contributing a sizeable share in the food basket of Himachal Pradesh.

4.2 Land use

In district Una net sown area accounts for about 24 % of the total geographical area of the district and about 28 % of the total area of the district as per revenue records. The total size of net sown area in 2005-06 was 36974 hectares. Although agro-ecological situations in the district allow cultivation of a large variety of crops, yet the cropping pattern is dominated by wheat during Rabi season and maize during kharif season. Out of the total cropped area of 72041 hectares in 2007-08 these two crops account for 88.7 % of the total cropped area in the district (wheat 45.8% and maize 42.9%). The remaining area is shared by paddy (2.8%), vegetables (1.9%), oil seeds (2.6%), pulses (0.7 %), fodder (2.3%) and other crops (1%).

Table-4.1
District Una: Area under Main Crops (in hectare)-2007-08

Wheat	Maize	Rice	Millets	Pulses	Oil Seeds	Sugarcane	Fodder	Total Cropped Area
32981	30939	2023	417	495	1881	198	1645	72041
45.8 %	42.9 %	2.8 %	0.6 %	0.7 %	2.6 %	0.3 %	2.3 %	100.0

Crop Rotations

The major crop rotation in Una is maize-wheat which occupies more than 80 per cent of the total area under different crop rotations. Triple/multiple cropping system can be seen in selected irrigated and valley areas. The prevalent crop rotations in the district are as follows;

(i) Crop Based Crop Rotations

Maize-wheat	Paddy-fodder-potato
Maize-potato-pulses	mash-wheat
Maize-toria- wheat	Moong-maize-wheat
Maize-oilseeds-vegetables	fallow-potato-wheat
Maize-peas-potato	green manure crop-paddy-wheat
Maize- mash-wheat + sarson	kharif pulses- rabi vegetables or potato or wheat
Paddy-wheat	Fodder-potato or rabi vegetables-fodder

(ii) Vegetable based crop rotations

Cucumber-potato-onion

Green manure/dhencha-potato-onion

Cucurbits-cabbage/cauliflower-onion

Sun hemp-tomato-onion

Cucurbits-peas-brinjal

4.3 Soil Health

Agricultural productivity of any area largely depends upon the health of its soil. Healthier the soil, better is the productivity. Thus, while preparing an agricultural development plan of a district, priority should always be given to the soil health improvement programmes. The soils of rain fed hilly tract in the district are of Antisols and Inceptisols type. Available nitrogenous and phosphatic element is medium. Due to more space and prone to excessive soil erosion, particularly in rainy season, the water holding capacity of this soil is low. The soils of Antisols order are found in irrigated plain valley tract and also in rainfed tracts. The soil texture varies between loamy sand to clay loam. The saline reaction pH is neutral and rarely acidic. No doubt, the soil conservation is to be considered with all seriousness, but the rapid falling of forest trees/deforestation, clearing of bushes and rampant grazing is leading to soil erosion of hills on large scale. Besides this, the heavy rains, flash floods are also causing enormous harm to the soil. The principal river of the district is Soan, which is flowing from North West to south east and meeting the Sutlej River near Anandpur Sahib in Punjab - 14 km down Santoshgarh. This river is also called the “River of Sorrow” because it causes heavy damage to crops and soils in the fields in rainy season. Therefore, it becomes necessary that the existing soil resources be well protected and guarded. Besides, soil erosion, mineral starvation and disturbances in soil physico-chemical characteristics have to be kept under check.

Intensive farming practices leave little time between harvesting of one crop and sowing of the next. As a result soils do not get adequate rest to replenish its lost fertility in a natural process. With a cropping intensity of 193 %, soils in Una district are also experiencing same problem. Thus in orders to maintain productivity levels, farmers use increasing doses of chemical fertilizers every year. This is evident from the fact that consumption of chemical fertilizers has increased from 23664 tons in 1985-86 to 48981 tons in 2006-07. Although use of chemical fertilizers per hectare in Una is about half the quantity used in Green Revolution areas, especially Punjab, yet the negative impact of chemical fertilizer use on soils has started surfacing. The soils have become deficient in all the main and micro nutrients. The level of organic carbon has declined to a level which is much below the minimum required level. The use of chemical insecticides and weedicides have further aggravated the situation as the population of friendly micro organisms in soils have declined to such a level that soils have become virtually lifeless.

Soil testing is very important for soil health. In order to maintain the fertility of the soil and minimize the cost of cultivation by balanced use of fertilizers, the soil testing programme has been initiated by the state government. The soil testing laboratories have been established in all the districts. In addition, soil testing vans have been purchased for testing the soil samples at the far flung areas. About 80,000 soil samples are collected for soil analysis annually in Himachal Pradesh. From 2003-04 to 2007-08 a total of 42060 soil samples from Una district were analyzed to know the status of soil health in the district. The analysis revealed that 78.9 % samples had low level of organic carbon, 80.6 % low level of $P_2 O_5$ and 54.3 % low level of K_2O. Table 4.2 shows the detail of these samples.

Table-4.2
Year wise Detail of Soil Fertility Status in Una District on the basis of Soil Samples

Year	Organic Carbon			P_2O_5			K_2O			Total
	Low	Medium	High	Low	Medium	High	Low	Medium	High	
2003-04	5616	1684	739	4281	2537	1221	4434	1465	2140	8039
2004-05	6650	1946	406	7483	1310	209	5682	2250	1070	9002
2005-06	8425	556	28	7532	1364	113	4575	3391	1043	9009
2006-07	6811	2051	141	7939	1001	63	5254	3248	501	9003
2007-08	5704	1263	40	6592	415	0	2901	3974	132	7007
	33206	**7500**	**1354**	**33892**	**6627**	**1606**	**22846**	**14328**	**4886**	**42060**

Source: Department of Agriculture, Una

The table above shows the soil fertility status in Una district, on the basis of result of soil samples, tested during 2003-04, 2004-05, 2005-06 and 2006-07. There is a need to improve the soil health in the district through the following steps.

Suggestions for the Improvement of Soil Health

(i) Upgradation/ Strengthening of Soil Testing Laboratories

It is recommended that the soil testing laboratory in the district be strengthened and this lab be upgraded for the determination of micro-nutrients. With the increased capacity in

soil and water sample testing of labs, the department will be able to issue soil health cards to individual farmers for each of their fields. The soil health cards will help the farmers to apply required doses of fertilizers and micronutrients in accordance with the fertility status of the soil. This will put a check on the indiscriminate use of fertilizers, and also enhance productivity.

Keeping in view the importance of these labs in promoting the use of fertilizers and micronutrients in a most judicious manner and the enhancement of agricultural productivity, the up gradation/strengthening of these labs should be taken up on priority. The cost of upgrading one lab to micronutrient testing laboratory is Rs 30 lakh and strengthening of other labs for general soil and water testing is Rs 5 lakh per lab. Rs 10 lakh per year will be needed for the operation and maintenance of these labs.

(ii) Use of Micronutrients

To overcome the micronutrient deficiency of soils, subsidy is needed to meet the 50 per cent cost of micronutrient requirement of the district. The table given below shows the tentative requirement of micro-nutrients for the main crops i.e. wheat, maize and paddy in the district.

Table-4.3
Crop wise tentative requirement of micro nutrients

Micro-nutrients		Crops			Total quantity of Micro-nutrients (Tons)	Price Rs Thousand per Ton	Total cost (Rs lakh)
		Wheat	Maize	Paddy			
	Total Area (hects)	31417 hects	30672 hects	2019 hects			
	per cent of area affected	Rate of application kg/ha					
Zn	30	-	25	60	266	25	66.5
Fe	25	-	15	15	123	15	18.5
Mn	10	10	-	-	31	50	15.5
Total	-						**100.5**

Zn is applied in 2 year cycle and other micro-nutrients every year. Based on this, the total cost on micro-nutrients comes to Rs. 67.5 lakh per year.

To improve the soil health, the application of micronutrients, as recommended by the State Agriculture University for the development of agriculture is a must. The National Food Security Mission (NFSM) has a provision of providing assistance @ Rs 500/ ha or 50% of the cost, whichever is less, in the identified districts.

(iii) Improving the Organic matter in the soils

As the level of organic matter in the soil has dropped to a very low level, the use of compost, vermi compost, bio-fertilizers and green manure are recommended to cover the deficiency. The National Horticulture Mission provides 50 per cent subsidy on the total cost or Rs 30,000/- per unit whichever is less for setting up a vermi compost unit.

Farmers, especially those who have orchards or are cultivating vegetables should be motivated to set up vermi compost units. The farmers should also be motivated to grow dhencha for green manuring after harvesting the wheat.

Keeping in view the declining natural fertility of the soils, all those proposals which are aimed to restore the natural health of soil and reduce dependency on chemical fertilizers should get priority in the agricultural development of the district.

(iv) Use of Leaf Colour Charts (LCC)

Leaf Colour Charts (LCC), a low cost technology is reported to have shown a saving of about 25kg of nitrogen per hectare on paddy crop. Keeping in view its usefulness the department should provide this low cost technology to every paddy-growing farmer.

Although the cost of LCC per farmer is only about Rs 40 to 60, and every farmer can afford it yet to attract the farmers for the adoption of this technology, subsidy as recommended be provided.

To sum it up, it may be said that the district has problematic soils. These are mostly course textured, low in organic matter, and have become virtually life less because of very low population of friendly micro-organisms. The natural fertility of the soils has declined as they have become deficient in most of the main and micro nutrients. To over come these problems, huge amount of funds are required. Funds are also required for strengthening/upgradation of soil and water testing labs, as well as, for their operation and maintenance. Use of green manure, compost, vermi-compost and bio-fertilizers is recommended for restoration of health of the soils in the district.

The ongoing Schemes

- C.S. 67/A (P) 16.17 Centrally Sponsored Macro Management Work Plan Agri (90:10). Under this scheme, funds are provided for various types of activities in the ratio of 90:10 by the Government of India and the State government respectively. The district received funds for;
  - Improvement of soil health; and
  - Reclamation of alkali soil
- C.S. 71/A(P) 16.39 ISOPOM

  The funding pattern of the scheme is 75:25 (Government of India: State). Although the main objective of the scheme is to increase the production of oil seeds, pulses and maize, yet its contribution in the improvement of soil health through crop diversification is no less significant. The scheme also has a provision for providing assistance for the distribution of gypsum/ pyrite/ liming/ dolomite and micronutrients needed for the improvement of soil health.

- The **Horticulture Technology Mission** also provides assistance for setting up a vermi compost unit for fruit and vegetable growers.
- **Subsidy on the transportation of fertilizers** The state government provides 100 per cent subsidy on transport of all kind of fertilizers to retail sale points for bringing the uniform sale rates in the state. The government is giving subsidy @ Rs 200 per MT on the cast of CAN, UREA and Ammonium Sulphate and @ Rs 500 per MT on NPK (12:32:16) and NPK (15:15:15)

4.4 Improving the Water Resources Status and Efficient Water use Technologies

Una district can be divided into two distinct regions namely the Rainfed Hilly region and the Irrigated Plain Valley region. The rainfed hilly region, falling in the lower Shivaliks, faces the problem of soil and water erosion. The soil strata are sandy to clay loam. A lot of area is affected by the gullied lands and area is rainfed in nature. A number of Soil & Water Conservation activities like Rain Water Harvesting Structures, Harvesting of Base Flow and Micro Lift Systems for Irrigation and Rain Water Harvesting Recharge Structures have been done and have shown very good results. There is still a lot of uncovered areas with the potential to improve the natural resource base of the area.

The irrigated valley region has mostly a plain surface. This region is irrigated by shallow as well as deep tubewells. The ground water table in this area is getting deeper and deeper every year which is a matter of concern. This area needs more attention towards water management and judicious use of water.

Improving the availability of Water for Irrigation

- The Micro Lift Projects are highly successful in the kandi sub mountainous area for providing life saving irrigation to the areas having deep underground water table. In these projects, water is lifted from a surface water source and supplied through underground water conveyance system to the fields. There is a huge scope of this activity in sub mountainous belt of the district. It is proposed that the small Micro Lift Projects must be constructed to lift the standing water and provide irrigation to other areas. It is proposed to construct 40 numbers of such projects, costing Rs. 2 crores during 5 year period.
- The Perennial Flow Projects (Tapping the Hill Seepage) have a huge scope in the district. In all blocks, there are numbers perennially flowing Khads which have not been tapped so far. The Hill Seepage water from these Khads can be tapped and provided to the farmers fields as life saving irrigation. It is proposed to construct 40 numbers of such projects costing Rs.4 crores during 5 years period.
- The channeling of Koohls can help in providing water for irrigation. In all the blocks there are many perennially flowing kacha Koohls. The water keeps flowing

whole of the year through these Koohls and goes waste. If these Koohls are properly channelized and lined, the water will be saved and be provided to at least 1000 hects for irrigation purpose. This water will be conveyed through gravity. It is proposed that 10,000 RMT of channels may be laid at a cost of Rs. 2 crores in the next 5 years.

- The Rain Water Harvesting-cum-Recharging Projects have a high potential in the entire hilly area of the district. These areas are in the middle catchments of the hills, which were earlier under cultivation but due to soil erosion and unchecked runoff, have almost become fallow and wasteland. These hills can be provided with the Rain Water Recharging Projects. By construction of these structures, the Rain Water can be arrested and the dried up catchments will get recharged with water. The excess water can be used for irrigation purpose. It is proposed to construct 50 numbers of such structures in the next 5 years at a cost of Rs. 2.50 Crores.
- The Farm Tanks are the best method of harvesting & storing rainwater in the fields of the farmers itself so that it may be used for irrigation at a later stage. It is proposed to construct Water Storage Tanks of the capacity which can store for a need of 15 days of irrigation. The cost varies from 2.0 Lakh to 3.5 Lakh for a Storage Tank. It is proposed that a subsidy of 50% be given for a maximum of Rs. 1 Lakh per Tank. An amount of Rs. 2.50 Crores is required for providing assistance on 250 Farm Tanks in the next 5 years.
- Village ponds for ground water recharge and irrigation: The ponds in the villages have got silted up or have been damaged. These need to be renovated and restored as the ponds can catch maximum of rain water in the plains. The excess water can be used for the life saving irrigation. The job will include the renovation, de-silting, lining and Micro Lift (if needed) etc. The possibility of using the ponds as Fish Ponds also needs to be explored. The cost will be Rs. 3 lakh per pond. An amount of Rs. 3 Crores is required for 100 Nos. of ponds in the next 5 years.

Improving the water use efficiency

Various methods for improving the water use efficiency have been suggested by the departments of agriculture, horticulture and soil conservation. These methods are as follows:

- The Land leveling in command area is highly recommended for efficient on-farm water management. This shall help in saving of precious irrigation water in the fields of farmers. It is proposed that 50% subsidy may be provided for leveling of 300 hectares of land in command area of various irrigation projects at a cost of Rs. 15 lakh.
- Use of laser leveler; The Laser Leveling technology helps in water saving and increasing the yield. The 8 laser levelers plus Tractors to the Co-operative Societies

on a subsidy of 50% can be provided. The total cost involved is Rs. 80 lakhs and the funds required are Rs. 0.40 lakh.

- Underground water conveyance system also saves 25-30per cent water. It is proposed that underground pipe system should be provided wherever it is possible; The Underground Water conveyance system on tubewells is very useful in checking the conveyance losses of water from the water source through the farmer's fields by 25-30% than the traditional Kacha Open Channels System, thereby reducing the water and electricity consumption. The cultivable area may be increased by 3-4% as the Kacha Channels being available for cultivation. It also saves the labour. The 3000 cum irrigation water and 125 units of electricity can be saved in case of paddy crop. It is proposed to cover 50 tubewells every year which will bring the total coverage of another 250 tubewells in 5 years. The total cost involved for the above purpose is Rs. 125 lakh and the farmers should be provided with 50% subsidy on system which requires Rs. 0.62 lakh.
- The utility of micro irrigation system as a water saving device, particularly in orchards and vegetable cultivation needs no emphasis. The Micro Drip Irrigation enhances irrigation and water use efficiency. Use of this technique saves 60-70% irrigation water and improves the yield as well as quality of the produce. It also help in enhancing fertilizer use efficiency. Use of this technique involves an average expenditure of about Rs. 50,000 per hectare. To make this technology popular among the farmers, subsidy of the order of 75% on the total cost of the system is needed. It is proposed to cover1000 hectares during 5 years under Drip / Sprinkler irrigation for various fruit and vegetable and Non-Horticulture crops. The total cost involved for this system is Rs. 500 lakh and farmers should be given 75% subsidy on the system. Therefore, it will require Rs. 375 lakh.
- It is claimed that use of Tensiometer to determine the most appropriate timings for irrigating paddy fields can save 15-20per cent water. The scientists recommend one Tensiometer for one field (of about one acre size).
- Certain agronomic practices of cultivation of wheat, rice and maize are water saving. These practices should be popularized among farmers through demonstrations in the villages.

To sum it up it can be said that, though, the water availability from all the sources must be increased for the development of agriculture in the district, equal importance should also be given for the most judicious use of water. Thus all schemes focusing on judicious use of water should be promoted in the district by providing liberal subsidy and more funds. Some of the above suggested works can also be undertaken under NREGA programmes.

4.5 Major Crops and Varieties

Wheat and maize are the main crops of Una district. Wheat is cultivated on an area of about 33 thousand hectares which is about 45.8 % of the total cropped area of the district. Wheat can be cultivated on a vast variety of soils ranging from sandy loam to clay loam. Despite the fact that farmers are using HYV seed of wheat which has a potential of giving yield of more than 45 q/ha, the average yield of wheat in Una district annually varies between 10 q/ha. to 25 q/ha. The yield under irrigated condition is generally more than one and a half times the yield under unirrigated conditions. Wheat is cultivated in the entire district. Map 4.1 shows the distribution of villages where wheat occupies more than 50 % of the total cropped area.

Maize is cultivated on about 31 thousand hectares which account for about 43 % of the total cropped area of the district, the well drained soils of Una are quite suitable for maize cultivation. However the productivity of course textured soils generally remains low than the fine textured soils. Maize in Una is cultivated almost entirely under rainfed conditions. Thus the amount of rainfall and time of rainfall highly effect the maize yield, which generally fluctuates in the district between 16 q/ha to 27 q/ha. Map-4.2 shows the distribution of villages where occupies more than 50 % of the total cropped area.

Rice is cultivated only on about 2 thousand hectares which is only about 2.8 % of the total cropped area of the district. Rice is cultivated mostly in the plain areas of the district under irrigation conditions. Rice is generally cultivated on heavy soils which can retain water. The average yield of paddy in the district annually varies between 16 q/ha to 27 q/ha. The main reason for low productivity is that farmers are using seed of local varieties. Map-4.3 shows the distribution of villages where area under rice is more than 5 hectares. The map shows that the number of such villages is very small and these are mostly located in the valley section of the district along river Soan.

Oil seeds are cultivated on an area of about 19 hundred hectares and pulses on an area of about 5 hundred hectares. Map-4.4 shows the distribution of villages where pulses are cultivated on more than 2 hectares and Map-4.5 shows the distribution of villages where oil seeds are cultivated on an area of 4 hectare.

The following varieties of wheat maize and paddy are cultivated in different AESs of the district;

Crop	Recommended Varieties				Varieties in Practice			
	AES-I	AES-II	AES-III	AES-IV	AES-I	AES-II	AES-III	AES-IV
Wheat	PBW-343, 396, 373 UP-2338 Raj- 3765	PBW-343, 502, 396, 373 Raj-3765, 3774	PBW-343,502,396, 373 UP- 2338 Raj- 3765, 3777	PBW-343,502,396, 373 UP-2338 Raj- 3765	Improved varieties	Improved varieties	Improved varieties	Local varieties
Maize	Hybrid, Local	Hybrid, Local	Hybrid, Local	Hybrid, Local	Hybrid, Local	Local	Hybrid, Local	Hybrid, Local
Paddy	High Yielding disease resistant varieties	High Yielding disease resistant varieties	Small area under hybrids due to lack of assured irrigation	Small area under hybrids due to lack of assured irrigation	Local tall varieties	Local tall varieties	-	-

Source: ATMA Report, Una

4.6 Input Management

Improved seeds, pesticides and insectisides and chemical fertilizers, besides better irrigation system, farm machinery and credit are the basic/required inputs for enhancing the crop productivity. The consumption status of these inputs in the district is as follows:

Agricultural inputs consumption

- **Improved seeds** play a vital role in increasing the productivity of different crops. The seeds are made available to the farmers timely and adequately through departmental sale outlets, KVK and private seed depots in the district.

The agricultural department also sells certified seeds through its departmental sale centres. The farmers are encouraged to grow certified seeds under Seed Village Programme. Seeds are sold at subsidized rates under ISOPOM and other schemes. Foundation seed is made available to the registered growers under the direct supervision of State Seed Certification Agency to produce certified seeds. A seed multification farm Pekhbela (established in 1960) is supplying seeds of wheat, maize, soyabean etc. to the farmers for maintaining quality of seeds. HP Seeds Certification Agency is functioning in the district since 1978-79. The detail of certified improved seeds of different crops, supplied to the farmers since 2001 is indicated in the Table-4.4

Table-4.4
Year wise distribution of improved seeds (in Qtls)

Sr No.	Year	Cereals	Pulses	Oilseeds	Vegetables	Potato seed
1	2000-01	4725	220	135	193	1880
2	2001-02	6028	186	100	43	542
3	2002-03	6540	88	55	60	1815
4	2003-04	8083	87	62	71	60
5	2004-05	5470	52	43	74	170
6	2005-06	7350	56	35	63	168
7	2006-07	6926	45	44	80	165
8	2007-08	6822	25	49	35	145

Source: Department of Agriculture, Una

The detail of public and private agencies, supplying seed and fertilizers in the district is shown in Table-4.5

Table-4.5
Detail of Inputs and Service Facilities in Una District

Name of the Block	Govt./Public Ext. Centres (Nos)	Private concerns				
		Private Fertilizer Dealers			Individual PPM Dealers (Nos)	Individual Seed Dealers (Nos)
		CAS (Nos)	HIMFED/IFFCO (Nos)	Individual (Nos)		
Una	08	44	06	18	30	32
Bangana	08	38	02	03	08	08
Haroli	08	33	-	15	22	42
Gagret	08	36	01	03	12	12
Amb	08	49	01	04	10	14
Total	40	200	10	43	82	108

Source: Department of Agriculture, Una

Although the cereal's seed consumption in the district has increased by 44 per cent from 2000-01 to 2007-08 but the Seed Replacement Rate (SRR) is not much encouraging in the district.

Plant Protection Material

The plant protection material in the form of pesticides/insecticides/weedicides is made available to the farmers timely and adequately, to control the diseases, weeds and insects. It is supplied/sold through the departmental sale depots and private dealers in the district. The table 4.6 indicates the increasing trend in the consumption of the plant protection material in the district. Its consumption has increased by 127 per cent from 2000-01 to 2007-08.

Table-4.6
Year wise distribution of Plant Protection Materials (in Qtls)

Sr No.	Year	Plant Protection Material
1	2000-01	105.8
2	2001-02	122.4
3	2002-03	130.0
4	2003-04	153.7
5	2004-05	168.0
6	2005-06	159.5
7	2006-07	177.4
8	2007-08	168.0

Source: Department of Agriculture, Una

The agriculture department, in coordination with Gram Panchayats and other concerned departments and organizations, organizes training workshops, awareness camps, campaigns and educate farmers to fight for the menace of crop diseases, insects and pests. The department provides 50 per cent subsidy on the cost of plant protection chemicals and equipments to the scheduled castes/scheduled tribes, IRDP families, farmers of backward areas and also to small and marginal farmers. The subsidy component (30 per cent of total cost) has also been extended to the big farmers from 1998. The consumption of pesticides in Una district is around 337 gms per hectare, which is more than the state average of around 225 gms per hectare.

- **Consumption of Fertilizers**

The chemical fertilizers are taken as an essential input in modern agriculture for enhancing the productivity of different crops. The fertilizers are made available to the farmers through Primary Agricultural Co-operative Societies (PACS) and private dealers in the district. The table indicates the consumption of Nitrogenous, Phosphorus and Potassic fertilizers in terms of nutrients.

The fertilizers consumption was started at demonstration level in late fifties in Himachal Pradesh, since then consumption of fertalizers is constantly increasing.

The fertilizers are made available to the farmers through Primary Agricultural Co-operative Societies (PACSs) and private depot holders. Table 4.7 shows that from 2000-01 to 2007-08 the consumption of fertilizers has more than doubled in the district. The consumption pattern of fertilizers as per different nutrients, that is, Nitrogen, phosphorus and potash, also shows that the awareness about the balanced use of different nutrients in proportions recommended by the agricultural scientists is increasing among the farmers. This awareness among the farmers is coming largely because of the efforts being made by the Agriculture Department in the district.

Table-4.7
Fertilizers Consumption in District Una (Nutrients Tonnes)

Year	Nitrogen (N)	Phosphorus (P)	Potash (K)	Total
2000-01	2017.332	681.651	254.568	2953.551
2001-02	3590.540	791.110	369.702	4751.352
2002-03	5321.753	1203.431	495.497	7020.681
2003-04	4388.036	1104.170	474.931	5967.137
2004-05	4500.024	1358.971	656.057	6515.052
2005-06	4126.394	1199.166	606.640	5932.200
2006-07	4706.508	1358.415	686.500	6751.423
2007-08	4757.164	977.581	750.966	6485.716

Source: Department of Agriculture, Una

The state government, through its department of Agriculture, is making all efforts to popularise bio-fertalizers in the state, with a capacity of 50 MTs annually. In 2001-02, the department took an initiative in promoting the use of bio-fertilizers in 1600 acres in Himachal Pradesh; however, quality control measures are necessary for which testing facilities should be made available.

4.7 Farm mechanization/Farm Equipments

Farm mechanization simply means use of machines to carry out farming operations. In the early stages of mechanization of farming meant simply the use of tractors and tractor driven implements like tillers and harrows for ploughing the land and trolly to transport the seed and fertilizers from the market to farm and agricultural produce from the farm to the market or to the farmer's house. Soon after, the use of other implements/machines like threshers, reapers, sowing drills cleaners, graders, harvesting combines etc began. In the

recent years, more efficient machines like zero-till seed-cum fertilizer drill, happy seeder, rotavator, raised bed planters etc. emerged on the scene.

Farm mechanization in Himachal Pradesh is limited to southwestern part of the district where land is mostly flat and undulated. In the hilly terrain, small tractors, power tillers and power sprayers are made available to the farmers on subsidy but mechanization is rather marginal and only some big farmers/orchardists use these implements. Country made age-old agricultural implements like wooden plough, wooden leveler, and sickle are still used by the farmers. However, after introduction of improved agricultural implements, the farmers have started using these implements now-a-days. The popularized modern farm implements in Una are tractors, trolleys, tubewells, pedal thresher, puddler, heavy soil plough, ox-driven discs, seed drills etc. The number of modern farm implements increased from 655 in 1972-73 to 7208 in 2003-04. Una district had 127 registered tractors in 2006-07. However the survey conducted by this team during 2008 revealed that the district has 1665 tractors. It seems that most of the tractors in Una are registered outside the district. In addition to that the district has 888 drills, 58 zerotill drills, 38 rotavators, and 222 other equipment. The blockwise distribution agricultural equipment is provided in table-4.8. There is a need to popularize the modern agricultural machinery like rotavator, zero-till seed drill, happy seeder and laser land leveler in plain areas of the district as these are mostly required in modern agriculture.

Table-4.8
Blockwise distribution of Agricultural Equipments in Una district

S. No	Block	Tractor	Drill	Zero Drill	Rota vator	Others	Total
1.	Haroli	290	105	3	7	15	420
2.	Gagret	319	235	-	-	0	554
3.	Amb	297	175	4	6	6	488
4.	Una	668	342	51	19	15	1095
5.	Bangana	91	31	-	6	186	314
	Total	**1665**	**888**	**58**	**38**	**222**	**2871**

Source: Field Survey

4.8 Special projects/programmes ongoing in the district

The ongoing schemes are;

Multiplication and Distribution of Seeds

Seed multiplication farms, seed stores and seed testing & certification programmes have been given due emphasis in order to maintain the availability and quality of seeds. Augmenting its resources would further strengthen seed certification agency. In order to increase the production of foodgrains, emphasis is on distribution of seeds of HYVs to the farmers. Augmentation of department resources will further strengthen the seed production storage, testing and certification programmes of the district.

Manure & Fertilizers

Fertilizer is a single input which helps in increasing the production to a great extent. The level of fertilizer consumption is continuously increasing. It is proposed to promote the balanced use of fertilizers together with the increased use of organics in the form of compost, farm yard manure, farm organic waste/crop residues and also bio-fertilizers. Strengthening of soil testing laboratories would also be undertaken in order to maintain the fertility. Soil testing laboratories in all the districts have been established with two mobile soil-testing vans purchased for testing the soil samples at site; one exclusively for the tribal areas. A central laboratory for analysis of soil samples and nutrient analysis has been established at Shimla. About 70 to 80 thousand soil samples are being analysed annually in the state and in Una district, the number is between 8 to 9 thousands annually. Soil Health Cards to all the farmers in the state are being issued.

Crop Insurance Scheme

In order to provide insurance cover to all crops and all farmers, the state Government has introduced "Rashtriya Krishi Bima Yojna" in the state from Rabi season - 1999-2000. Crops covered are wheat, barley, maize, paddy and potatoes. Subsidy on premium in respect of small and marginal farmers is provided on sunset basis as per provision of the scheme. The scheme is compulsory for loanee farmers and optional for non-Ioanee farmers. The scheme provides comprehensive risk insurance against yield losses due to drought, hailstorm, floods and pests disease etc. The Agriculture Insurance Company (AIC) of India is implementing the scheme. The state and Government of India share the claims on account of losses to crops and the subsidy on premium equally.

Plant Protection

The approach adopted is to reduce consumption of plant protection chemicals by gradually switching to biological control of pests /diseases. During each season, campaigns are organised to fight the menace of crop diseases insects and pests etc.

Commercial Crops

Under diversification approach, emphasis is being laid on the production of off-' season vegetables, quality vegetable seeds, potato and ginger besides oil seeds and pulses. This is proposed to be strengthened and organised on an extensive scale. Suitable areas in the state for the purpose of vegetable cultivation would be intensively surveyed and identified and the farmers in the newly identified areas would be encouraged to take up these programmes. The cropping pattern shifts from cereals to vegetables would be specially monitored in all such areas which are being brought under the culturable command area of the new irrigation schemes.

Extension and Farmers Training

The objective of this scheme is extension of knowledge input to the farmers and extension functionaries through establishing a sound network of extension systems so that this knowledge percolates to the farmers at the grass root level for adoption. Efforts would be made to strengthen the extension network and adopt improved extension methodologies like IT for packaged knowledge to the farmers. Agri-clinics/Agri-business centres are being established with the support of NABARD to accommodate unemployed agricultural graduates.

Agriculture Engineering

The scheme envisages supply of agricultural implements and machinery to the farmers besides designing and fabrication of implements suited to hill conditions.

Scheme for supplementation /complementation of State efforts through work plan under macro-management approach for Agriculture Development

Under this approach, major emphasis is being laid on improvement of cereal crops, transfer of technology, construction of water storage tanks, development of off-season vegetables, spices, promotion of quality seed production, integrated nutrient management balanced use of fertilizers besides active involvement of women in agriculture. The work plans submitted by the State get 90% Central support (80% grant and 20% loan) and 10% share from the State Plan. The programmes are accordingly being implemented as per the work plan approved.

Centrally Sponsored Micro Management Work Plan Agri (Development of Agriculture Marketing Infrastructure and Information) Scheme

Under this scheme farmer's training camps, about marketing of agricultural produce, are organized at district, block and village levels.

Marketing of agricultural produce is a very important aspect of farming. Adoption of proper methods of marketing of their produce can enhance the income of farmers. Thus the scheme is very useful for the farmers and it should be continued during XI Plan.

Centrally Sponsored Micro Management Work Plan Agri (extension and Training) Scheme

The officials of the agriculture department are sent on agriculture study tours to other states to get information of best practices adopted there. Literature on new farming techniques is also distributed among the farmers under this scheme.

Since such study tours are very useful to enhance and update the knowledge base and skill of agricultural officers, this scheme should continue.

Farm Mechanization Programme

Under this programme, proper knowledge is provided to the farmers about the right choice of the agricultural machinery, its maintenance and enhancement in its efficiency through farmers training camps.

It is very useful scheme for the farmers and thus should be continued.

Bio-Gas Development programme

Under this scheme, the technical information about setting up domestic size Bio-gas plants is provided to the farmers.

Biogas not only provides fuel to the farmers but also manure, which is very essential for the restoration of soil health. Thus the scheme should be continued. It is also recommended that subsidy component should continue.

Integrated Scheme of Oilseeds, Pulses, Oil Palm and Maize (ISOPOM)

This is a centrally sponsored scheme on 75:25 per cent sharing basis between Government of India and state Government. Under this scheme cultivation of oilseeds, pulses, palm oil and maize is provided by the various kinds of incentives. Only maize crop is considered for Himachal Pradesh. In this new scheme, all the ongoing schemes of OPP, NDDP and AMDP have been merged. The main components of the scheme are; distribution of improved seeds, block level IPM demonstrations; distribution of plant protection material and equipments, distribution of sprinkler sets; and providing pipes to carry water from water sources to the fields and publicity etc.

Among the beneficiaries, the representation of the SCs, STs and women farmers is must. The subsidy (as per Government policy) is also given on the purchase and production of breeder seed, foundation seed and certified seed. Farmers' training camps are also organized to educate them about the latest technology for the cultivation of maize. To refresh and update the knowledge of extension officers, training workshops for them are also organized.

Since this scheme aims to reduce our dependence on imports of maize, pulses and oilseeds, promote crop diversification and improve the health of soils, it must continue. Infact this scheme is highly relevant for the Una district, which is traditionally a maize producing district and where soil fertility is continuously declining. More numbers of minikits of hybrid maize for free distribution and more funds for subsidy on inputs be provided to the district to increase the area under this crop.

Problems and Prospects of Crop Sector

At present there is a deficit in the state's production of food grain crops except maize. Despite the existing missions for increase in the production of pulses and oilseeds, the yields are still low. Infact, the average yield of wheat, paddy, pulses and oilseeds, besides many other crops, is lower even than the Indian averages. The main reasons attributed to low production are:

- Cultivated land is undulating
- Soils are course grained and in many areas shallow
- Only about 23 % of the net sown area is irrigated
- Land holdings are small and scattered
- Inputs use is limited
- Farm mechanization is low; and
- Limited use of quality and certified seeds

Apart from the above listed factors poor management of production and non dissemination of appropriate technologies are the key factors responsible for low productivity in Una district. In some Hilly South East Asian and European regions in the world, the physical situations are similar to Himachal Pradesh, but the productivity is much higher. Therefore, there is tremendous scope for improving the land use pattern and minor irrigation schemes for giving a boost to agricultural production in Himachal Pradesh. Here the dissemination of suitable and practical technologies which are available have to receive due emphasis.

4.9 Yield Gap Analysis of Major Crops

Wheat, maize and paddy are the main crops of district Una. In 2007-08 wheat, maize and paddy occupied about 45.8 %, 43.0 % and 2.8 % of the total cropped area respectively. There are vast variations in the yield of these crops at the regional as well as local level. There are also large fluctuations in the yield of these crops from year to year. Table 4.9 shows that normal yield (average of yield in kg per hectare from 1993-94 to 2002-03) of main crops in Himachal Pradesh varies from district to district. For example normal yield of wheat under irrigated conditions varies from 1019 kg/ha in Kinnaur to 3266 kg/ha in Lahaul and Spiti district. Similarly yield of wheat under unirrigated conditions varies from 971 kg/ha in Kinnaur to 2053 kg/ha in Kulu district. The respective figures under irrigated and unirrigated conditions for Una are 2864 kg/ha and 1622 kg/ha and for the state 2175 kg/ha and 1538 kg/ha. Similarly normal yield of maize varies from 2199 kg/ha in Kangra to 3150 kg/ha in Lahaul & Spiti district under irrigated conditions and from 1876 kg/ha in Bilaspur to 2822 kg/ha in Sirmaur district under unirrigated conditions. The corresponding values for the state are 2634 kg/ha under irrigation and 2297 kg/ha under unirrigation. In Una maize is cultivated only under unirrigation conditions and the normal yield is 1901 kg/ha which is less than the state average. The normal yield of paddy varies from 1193 kg/ha in Hamirpur to 2513 kg/ha in Una district under irrigation condition and from 1006

kg/ha in Solan to 1553 kg/ha in Sirmaur district under unirrigated condition. The yield in Una district under unirrigated conditions is 1226 kg/ha and for the state under irrigated and unirrigated conditions is 1646 kg and 1255 kg/ha respectively. The table shows that under irrigation conditions Una district has the highest normal yield in case of paddy and third highest (after Lahaul & Spiti and Kulu districts) in case of wheat. By contrast normal yield of maize which is grown only under unirrigated conditions in the district is one of the lowest in the state. Only district Bilaspur has lower yield than Una district. Similarly there are vast inter-district variations in the yield of other crops.

Table-4.9
District-wise Normal Yield (per Hectare in kg) of different crops in Himachal Pradesh

Sr. No	Name of the Crop	Bilaspur		Chamba		Hamirpur		Kangra		Kinnaur		Kullu		L&S	
		Irr.	Unirri	Irr.	Unirri	Irr.	Unirri	Irr.	Unirri	Irr.	Unirri	Irr.	Unirri	Irr.	Unirri
1	Wheat	1707	1663	1848	1542	-	1358	1742	1553	1019	971	2946	2053	3266	-
2	Gram	1151	997	-	1357		359	875	-	-	-	-	-	-	-
3	Masur	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Onion	7165	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Mustard	1357	857	-	295	-	-	-	-	-	-	-	-	-	-
6	Taramira	-	588	-	296	-	-	-	-	-	-	-	-	-	-
7	Maize	-	1876	-	2709	-	2068	2199	2004	-	2319	-	2410	-	-
8	Paddy	1745	1356	1475	1370	1193	1209	1704	1217	1226	1117	1834	1289	-	-
9	Sugarcane	-	7991		295	-	-	-	-	-	-	-	-	-	-
10	Groundnut	-	567			-	-	-	-	-	-	-	-	-	-

Contd.

Sr.	Name of the Crop	Mandi		Shimla		Sirmaur		Solan		Una		H.P.	
		Irr.	Unirri	Irr.	Unirri	Irr.	Unirri	Irr.	Unirri	Irr.	Unirri	Irr.	Unirri
1	Wheat	1660	1464	2635	1553	2185	1683	2047	1459	2864	1622	2175	1538
2	Gram	-	1015	-	1266	1097	1089	1392	1194	-	1357	1129	1037
3	Masur	-	348	-	250	661	537	-	1343	-	848	1087	769
4	Onion	-	-	-	-	10299	9493	-	-	12807	11008	10090	10251
5	Mustard	356	226	487	225	-	637	537	487	-	988	845	531
6	Taramira	355	225	487	225		637	-	988	-	365	421	475
7	Maize	2553	2402	-	2316	-	2822	-	2442	-	1901	2634	2297
8	Paddy	1311	1053	1726	1404	1725	1553	1654	1006	-	1226	1646	1255
9	Sugarcane	1404	1393	-	-	31192	24531	-	-	-	16492	16298	12602
10	Groundnut	-	-	-	-	-	-	-	1427	-	1050	-	1015

Source: Director of Land Records, Himachal Pradesh, Shimla

Table-4.10
Average Yield of Main Crops in Una district (in kg/ha.)

Year	Wheat	Maize	Paddy
1993-94	1505	1751	2265
1994-95	2077	1809	2460
1995-96	1567	2071	1935
1996-97	2118	1957	2357
1997-98	**2476**	1931	2555
1998-99	1975	2080	2285
1999-2K	2201	2330	2428
2000-01	1425	2000	2050
2001-02	1778	2303	**2666**
2002-03	2083	**1650**	1703
2003-04	1546	**2674**	2043
2004-05	2175	2144	1964
2005-06	**965**	1829	**1640**
2006-07	2185	2125	2259
2007-08	1687	2339	2299

Source: Department of Agriculture, Una (Himachal Pradesh)

Table 4.10 shows average yield of wheat, maize and paddy from 1993-94 to 2007-08 in district Una. The table shows marked annual variations in the yield of these crops ranging

from 965 kg/ha (2005-06) to 2476 kg/ha (1997-98) in case of wheat, 1650 kg/ha (2002-03) to 2674 kg/ha (2003-04) in case of maize and from 1640 kg/ha (2005-06) to 2666 kg/ha (2001-02) in case of paddy. These variations to a great degree are associated with the annual variations in the amount and time of rainfall. Since about 77 % of the net sown area of the district is dependent on rains, the amount of rainfall as well as time of rainfall play a most determining role on the yield of crops. It will not be out of place here to mention that timely rains, even in less quantity, is more beneficial for the yield of crops than the untimely or delayed rain in more quantity. From the discussion above it emerges that if dependence on rains is reduced by bringing the entire net sown area under assured irrigation, the average yield of these crops can be increased substantially. This is very effectively demonstrated by Punjab where 97.4 per cent of net sown area is irrigated. There the yield of paddy generally increases in the drought years, because paddy cultivation in Punjab is not dependent on rains. By extending irrigation every yield of wheat, maize, paddy and other crops can be increased substantially.

A micro study of 7 villages, selected two each from Agro-Ecological Situations I, II, and IV and one from AES-III in the districts conducted by the Krishi Vigyan Kendra Una also revealed marked variations in the productivity of wheat, maize and paddy within the district. The study also revealed marked gaps in the expected and actual yield of these crops in different regions of the district. The table shows inter-AES variations in average yield of wheat, maize and paddy as well as gaps between actual and expected yield of these crops in different AESs.

Table-4.11
Inter-AES variations in the yield of major crops and gaps in the actual and expected yield of these crops

Crop	Actual & Expected Yield	AES-I	AES-II	AES-III	AES-IV
Wheat	Actual Yield	25.00	17.50	20.25	15.20
	Expected Yield	40.00	40.00	30	30.00
Maize	Actual Yield	20	12	20	18
	Expected Yield	20-25	20-25	20-25	20-25
Paddy	Actual Yield	18	18	-	-
	Expected Yield	50-60	50-60	-	-

The table 4.11 reveals that productivity of all the major crops is highest in AES-I (Swan Bela). This is largely because the land in this AES is level, slope in gentle, soils are deep and fertile and has better irrigation facility than other AESs. Productivity level in AES-III is also fairly good because irrigation facility in this AES is also good. Productivity of wheat was lowest in AES-IV which is a hilly tract and cultivation is almost entirely dependent on rainfall. However yield of maize was lowest in AES-II which accounts for about 48 % of the net sown area of the district. The table also reveals that there is a yield gap between expected and actual yield of wheat in all the AESs. This gap was highest in AES-II. Against the expected yield of 40 q/ha. the actual yield was only 17.50 q/ha. the yield gap was also very large in AES-IV where the actual yield is 15.20 q/ha against the expected yield of 30 q/ha. The gap in the yield of maize however is very small in AES-I,

III and IV. But in AES-II it is very large. The yield in this AES is only about 50 % of the expected yield. Paddy is cultivated only in AES-I and II and in both the AESs the actual yield is only 18 q/ha. against the expected yield of 50-60 q/ha.

Reasons for Yield Gap

The inter-AES variations in the yield of main crops are largely associated with topography of the land, soil quality and above all the irrigation facilities available in the area. The gaps in the actual and expected yield of crops on the other hand are largely associated with the gaps in the recommended practices and actual practices followed by the farmers with regard to quality and quantity of seed used; sowing time and sowing method; use of organic manure, chemical fertilizers and micro nutrient; methods of application of fertilizers for basal dose and top dressing, soil, water, weed and insect management technique used and method of harvesting of crop.

The gaps in the expected and actual yield of crops indicate that there is a lot of scope for enhancing the productivity and production of different crops in the district. Going by these gaps one can say that the productivity and production of wheat in the district can be enhanced by 40-45 %, that of maize by about 25-30 % and of paddy by 100-125 % from their present levels. However these targets cannot be achieved in a short period of time. Moreover it will require reducing the gap between the recommended practices and the actual practices followed by the farmers for the cultivation of these crops. The most critical gap in this regard is irrigation which is also the most difficult gap to fill-in.

Research/Extension/Adoption Gaps

The ATMA team Una identified specific Reserch/Extension/Adoption gaps in the recommended and actual agronomic practices with regard to wheat, maize and paddy in different AESs of the district. Their findings are based on an intensive study of selected villages from different AESs in Una district. Their findings have been provided below:

Wheat

Farming Situation

Wheat is a major crop of Himachal Pradesh as well as of district Una under both irrigated and rainfed conditions. It is cultivated on almost all type of soils. It is also cultivated in salt affected as well as in poor quality soils. Wheat is grown mainly under Wheat-Paddy/Maize crop rotation.

Specific Gaps in Adoption of Improved Technology

Details about the recommended and existing farming practices of wheat under each AES of district Una are presented in Table-4.9 and the gaps in adoption of recommended practices have been given in Table-4.10. There is a partial gap in the adoption of recommended varieties. Varietyies like PBW 343, 396,373, UP-2338, Raj-3765 are taken

as the most popular varieties by majority of farmers in all the AESs. A few farmers are growing unrecommended varieties from the adjoining states. Thus, a gap can be observed in the selection of varieties. There exists a partial gap with reference to sowing time as farmers usually become late in the sowing of wheat which mainly depends on rain. There is a partial gap in seed rate in AES- IV. A full gap exists in the adoption of seed treatment in all the four AESs, because the farmers are not using any chemical for seed treatment due to the ignorance about its importance.

Regarding the method of sowing, there is partial to full gap in adoption of recommended practice.This is due to the unawareness of the farmers as well as nonavailability or no use of fertilizer cum-seed drill.

As far as the basal application of NPK is concerned, a partial gap exists in the district due to the lesser dose of this nutrient. For top dressing application of nitrogenous fertilizers, the farmers in three AESs (except AES-IV) are using recommended doses. The recommendation of potassic fertilizers is only in deficient soils but majority of farmers are not applying this fertilizer.

In case of method of application of fertilizers as basal dose, a full gap exists in all AES's as the farmers are using broadcasting method against the recommended line method. However, there is a nilgap in the application of nitrogenous fertilizers for top dressing.

So for as micronutrients application is concerned there exists a full gap in the district. Nobody is practicing the recommended package.

In case of control of termites, a full gap exists in all the AESs as very few farmers are following the recommended application of insecticides.

Full gap exists in disease management practices in all the AESs. Regarding water management, the recommendation is of five irrigations, but there is a partial gap in AES-I and II and full gap in AES-III and IV because wheat is cultivated here mainly under rainfed conditions. There is a full gap in the use of harvesting method, as in all the AESs it is being done manually.

In case of productivity also, there exists a huge gap which may be attributed to the non following of recommended practices in all the aspects of wheat crop cultivation.

Table-4.12
Recommended V/s Farmers' Practices for Wheat in the Representative Villages under each AES

Sr. No.	Agronomic Practice	Recommendations	Practice followed by the farmers			
			AES-I	AES-II	AES-III	AES-IV
1	**Sowing**					
	- Timing	Oct-Nov	Oct-Nov	Depends on rain	Nov-Dec	Oct-Nov
	- Method	Line Sowing	Line Sowing	Broadcasting	Line Sowing	Broadcasting
2	**Varieties**	PBW-343, 396, 373 UP-2338, RAJ-3765 etc.	Improved Varieties	Improved Varieties	Improved Varieties	Local varieties
3	**Seed R+ate (per ha)**	100 kg/ha	100 kg/ha	100 kg/ha	100 kg/ha	125 kg/ha
4	**Seed Treatment**	Bevistin @ 3g/kg seed	Majority of farmers practicing	NIL	Nil	Nil
5	**Organic manure (Tons/ha)**	10-15 tons/ha	5-8 tons/ha	5-6 tons/ha	8-10 tons/ha	4-5 tons/ha
6	**Fertilizers/ Nutrients (kg/ha)**					
	- Basal (N+P+K)	60:60:60 NPK/ha	50:45:45 kg/ha	30:30:30 kg/ha	50:50:40 kg/ha	25:20:20 kg/ha
	- Top Dress (N)	60 kg N/ha	60 kg/ha	60 kg/ha	60 kg/ha	20 kg/ha
7	**Method of fertilizer application**					
	- Basal	Line Method	Broadcasting	Broadcasting	Broadcasting	Broadcasting
	- Top Dress	Broadcast Method	Broadcasting	Broadcasting	Broadcasting	Broadcasting
8	**Micro-nutrients**					
	- Dose (kg/ha)	Package available	-	-	-	-
	- Method of Application	As per soil test value	-	NIL	NIL	NIL
9	**Insect Management**	Soil treatment with insecticides	Nil	Nil	Nil	Nil
10	Disease Management	Seed Treatment Spray with appropriate fungicides particularly in seed crops	Nil	Nil	Nil	Nil
11	**Weed Management**					
	- Mechanical	Manual	Manual	Manual	Manual	Manual
	- Herbicides	Isoproturone & 2,4-D	IsoproturoneY2	Partially used	Partially used	Partially used
12	**Water Management**					
	- No. of Irrigations	5 Irrigations	3 Irrigations	Only once	Rainfed	Total dependent on rain
	- Methods	As per requirements	-	-	-	
13	**Soil Management**					
	- Water Logging	Technology Available	-	-	-	-
14	**Method of Harvesting**	Mechanical	Manual	Manual	Manual	Manual
15	**Average Yield**					
	- Grains	40 qtl/ha	25qtl/ha	17.5 qtl/ha	20.25 qtl/ha	15.20 qtl/ha
	- Fodder	60 qtl/ha	40 qtl/ha	2.5 qtl/ha	45.50 qtl/ha	20.35 qtl/ha

Source: ATMA Report, Una

Table-4.13
Adoption Gap in the Cultivation Practices for Wheat in the Representative Villages under Each AES

S.No.	Agronomic Practices	AES-I	AES-II	AES-III	AES-IV
		Wheat	Wheat	Wheat	Wheat
1	**Sowing**				
	Time	N	P	P	N
	Method	N	P	P	P
2	**Varieties**	N	N	N	F
3	**Seed Rate (per ha)**	N	N	N	P
4	**Seed Treatment**	P	F	F	F
5	**Organic manure (tons/ha)**	P	P	P	F
6	**Fertilizers/Nutrients (kg/ha)**				
	Basal (N+P+K)	P	F	P	P
	Top Dress (N)	N	N	N	P
7	**Method of Fertilizer Application**				
	Basal	P	-	P	P
	Top Dress	N	F	N	N
8	**Micro-nutrients**				
	Dose (Kg/ha)	F	F	F	F
	Method of Application	F	F	F	F
9	**Insect management**	F	F	F	F
10	**Disease Management**	F	F	F	F
11	**Weed Management**				
	Mechanical	N	N	N	N
	Herbicides	P	P	P	P
12	**Water Management**				
	No. of Irrigations	P	F	F	F
	Methods	-	-	-	-
13	**Soil Management**				
	Water Logging	-	-	-	-
14	**Methods of Harvesting**	N	N	F	N
15	**Average yields**				
	Grain	P	P	P	F
	Fodder	P	P	P	P

Source: ATMA Report, Una (**F-** Full Gap, **P-** Partial Gap **N-** No Gap)

Maize

Farming Situation

Maize is cultivated in the district on all types of soils, ranging from loamy to sandy textured as well as in Entisols and Inceptisols soils of undulated topography, under both irrigated and unirrigated conditions. Maize is mainly grown after wheat crop.

Specific Gaps in Adoption of Improved Technology

Details of the recommended and existing practices followed by the farmers in each AES are presented in Table-4.17 and gaps in the existing practices are given in Table-4.18. The table shows that there exists a partial gap in all the AES's in the adoption of recommended maize varieties. Most farmers cultivate local varieties against the recommended hybrid varieties.

In case of sowing time, there is no gap in any AES as the farmers sow maize at the recommended time, i.e. during the months of May-June.

A partial gap is observed in AESs II, III & IV with regard to seed rate as farmers are using higher seed rate. The recommended seed rate is used by the farmers in AES-I. This is due to the fact that AES-I has the facility of irrigation and its soils are slightly heavy textured as compared to other AESs.

There exists a full gap in all the AESs in case of seed treatment. This is probably due to lack of awareness among farmers about the importance of seed treatment. The farmers, who are sowing hybrid varieties of maize, are practicing the recommended seed that is already pretreated. Regarding the use of organic manure, there is a partial gap in all AESs.

A full gap in using micro-nutrients can be observed in all the AESs. Disease management practices, recommended by KVK/State Agriculture University are not being practiced in three AESs and partially used in one AES.

In case of chemical weed control, a full gap exists in all the AESs because almost all the farmers are controlling weeds by manual method. Irrigation is generally depending on rain. There is no gap in harvesting practices. A partial gap can be seen in yield also.

Table-4.14
Recommended V/s Farmers' Practices for Maize in the Representative Villages under each AES

Sr. No.	Agronomic Practice	Recommendations	Practice followed by the farmers			
			AES-I	AES-II	AES-III	AES-IV
1	**Sowing**					
	- Timing	May-June	May-June	May-June	May-June	May-June
	- Method	Line Sowing	Broadcasting	Broadcasting	Broadcasting	Broadcasting
2	**Varieties**	Hybrid Local	Hybrid Local	Local	Hybrid Local	Hybrid Local
	Seed Rate per/ha)	20 kg/ha	20 kg/ha	25 kg/ha	25 kg/ha	25 kg/ha
3	**Seed Treatment**	Yes	No	No	No	No
4	**Organic Manure (Tons/ha)**	10-15 tons/ha	5 tons/ha	5-6 tons/ha	5-6 tons/ha	5-6 tons/ha
5	**Fertilizers/Nutrients (kg/ha)**	90:45:30 or 120:60:40	No Basal Dose	No Basal Dose	No Basal Dose	06:30:15
6	- Basal (N+P+K)	Basal Dose and top	Basal Dose	Basal Dose	Basal Dose	Basal Dose in Last Quantity
	Method of fertilizers	Dressing				
	Micro-nutrients					
7	- Dose (kg/ha)	Package available as	-			
	- Method of Application	Per soil test value	-			-
	Insect management		Nil			-
8	**Disease Management**	Recommended by the KVK/SAU	Nil	Partially controlling	-	
9	**Weed Management**					
	- Mechanical	Manual	Manual	Manual	Hard Weeding	Manual
	- Herbicides	Herbicides	Partially used	Partially used	Partially used	Altrazine
10	**Water Management**					
	- No. of irrigations	As per requirements	Total dependent on rain	Total dependent on rain	Total dependent on rain	Total dependent on rain
	- Methods					
11	**Method of Harvesting**	Manual	Manual	Manual	Manual	Manual
12	**Average Yield**					
	-Grains	20-25 qtl/ha	20 qtl/ha	12 qtl/ha	20 qtl/ha	18 qtl/ha
	- Fodder	50-75 qtl/ha	40 qtl/ha	30 qtl/ha	30 qtl/ha	35 qtl/ha

Source: ATMA Report, Una

Table-4.15
Adoption Gap in the Cultivation Practices for Maize in the Representative Villages under Each AES

S. No.	Agronomic Practices	AES-I	AES-II	AES-III	AES-IV
		Maize	Maize	Maize	Maize
1	**Sowing**				
	Time	N	N	N	N
	Method	P	F	F	F
2	**Varieties**	P	F	P	P
3	**Seed Rate (per ha)**	N	P	P	P
4	**Seed Treatment**	F	F	N	F
5	**Organic manure (tons/ha)**	F	P	P	P
6	**Fertilizers/Nutrients (kg/ha)**				
	Basal (N+P+K)	F	-	P	P
	Top Dress (N)	-	P	-	-
7	**Method of Fertilizer Application**				
	Basal	-	P	F	P
	Top Dress	F	-	-	-
8	**Micro-nutrients**				
	Dose (Kg/ha)	F	F	F	F
	Method of Application	F	F	F	F
9	**Insect management**	F	P	F	F
10	**Disease Management**	F	P	F	F
11	**Weed Management**				
	Mechanical	N	N	N	N
	Herbicides	P	P	P	P
12	**Water Management**				
	No. of Irrigations	F	P	P	P
	Methods	-	-	-	-
13	**Soil Management**				
	Water Logging	-	-	-	-
14	**Methods of Harvesting**	N	N	N	N
15	**Average yields**				
	Grain	P	P	P	P
	Fodder	P	P	P	P

Source: ATMA Report, Una (**F-** Full Gap, **P-** Partial Gap **N-** No Gap)

Paddy

Farming Situation

Paddy is grown on sandy loam and clay loam soils under assured irrigation systems with adequate availability of water. Paddy is cultivated after wheat/potato crops. It is mainly grown in AES-I & II. In other AESs, paddy is grown on a very small area.

Specific Gaps in Adoption of Improved Technology

Regarding the transplanting/sowing of paddy crop, there is no gap between recommended and existing practices. Paddy is transplanted/sown in the month of May-June. In the method of sowing, there is full gap. Most of the farmers are using broadcasting method and only few are using transplanting techniques. Partial gap can be seen in the selection of varieties. Mostly, the local tall varieties are grown in place of high yielding disease resistant varieties. There is a full gap in seed treatment practices. Very few famers are treating the seed. Against the recommendations of 10-15 tonnes of organic manure, only 5 tonnes are given. There is partial gap in the use of fertilizers. Mostly top dressing method is used for fertilization.

A full gap can be seen with regard to INM package. Only a small number of farmers are using micro-nutrients. A partial gap exists for pest and disease management practices, only a few progressive farmers are following such practices. Weed management is done manually therefore, there is no gap in this practice. There is a partial gap in case of herbicides use. Numbers of irrigation are less than the recommended numbers due to shortage of irrigation water. There is no gap in the use of harvesting method. It is done manually. So far as per hectare yield is concerned, there is partial gap. The actual yield is much less than the expected yield.

Table-4.16
Recommended V/s Farmers' Practices for Paddy in the Representative Villages under each AES

Sr.No.	Agronomic Practice	Recommendations	Existing Practices
1	**Sowing**		
	- Timing	May-Jun	May-Jun
	- Method	Transplanting	Broadcasting transplanting
2	**Varieties**	High Yielding disease resistant	Local tall varieties
3	**Seed Treatment**	Yes	NO
4	**Organic manure (Tons/ha)**	10 : 15 tons/ha	5 tons/ha
5	**Fertilizers/Nutrients (kg/ha)**	120-60-40	80-20-20
6	**Method of fertilizer application**	Basal Dose and top Dressing	Basal & Top Dressing
7	**INM**	Package Available	Not followed
8	**Micro-nutrients**		
	- Dose (kg/ha)	Package Available as per soil test value	Few farmers are using
	- Method of Application		
9	**Insect Management**	Recommended by the KVK/SAU	Few Progressive farmers are practicing
10	**Disease Management**		Do
11	**Weed Management**		
	- Mechanical	Manual	Manual
	- Herbicides	Herbicides	Partially used
12	**IPM**	Package available	Not followed
13	**Water Management**		
	- No. of Irrigations	As per requirements	Less no. of irrigation
	- Methods		
14	**Method of Harvesting**	Manual	Manual
15	**Average Yield**		
	- Grains	50-60 q/ha	18 q/ha
	- Fodder	80-90 q/ha	35 q/ha

Source: ATMA Report, Una

Table-4.17
Adoption Gap in the Cultivation Practices for Paddy in the Representative Villages under Each AES

Sr. No.	Agronomic Practices	AES-I	AES-II
		Paddy	**Paddy**
1	**Sowing**		
	Time	N	N
	Method (i) Broadcasting (ii) Transplanting	 F P	 F P
	Varieties	P	P
2	**Seed Treatment**	F	F
4	**Organic manure (tons/ha)**	P	P
5	**Fertilizers/Nutrients (kg/ha)**	P	P
6	**Method of Fertilizer Application (Basal dose and top dressing**	P	P
7	**INM**	F	F
8	**Micro-nutrients**		
	Dose (Kg/ha)	P	P
	Method of Application	P	P
9	**Insect management**	P	P
10	**Disease Management**	P	P
11	**Weed Management**	N	N
12	**IPM**	F	F
13	**Water Management**		
	No. of Irrigations	P	P
14	**Methods of Harvesting**	N	N
15	**Average yields**		
	Grain	P	P
	Fodder	P	P

Source: ATMA Report, Una (F- Full Gap, **P**- Partial Gap **N**- No Gap)

Research/Extension/Adoption Gaps Identified through a Sample Survey

The Survey

A primary survey was conducted in the district in October, 2009 by this research team. The main objective of that survey was to have first hand information about the agricultural practices followed by the farmers. The infrastructure and agricultural machinery available with the farmers, inputs used, quality of fertilizers and micro-nutrients used, quality of seeds used, measures used for crop protection, methods used for weed management, cost incurred for disease and pest management for different crops, water saving and water harvesting methods used if any, crops harvesting methods used, post harvest methods used, the position of agricultural credit etc. For this purpose, 10 villages (2 villages from each block) were selected from the district. These villages were Joal and Baruhi from Bagana block, Jadla Keori and Badhera Rajputan from Gagret block, Parnamb (Slohi) and Thathal from Amb block, Panjawar and Isspur from Haroli block and Fatehpur and Rampur from Una block. From each village, 5 farmers were interviewed except in case of Salohi Fatehpur and Panjawar from where 4 farmers from each village were interviewed. The operational land holdings of those farmers were as follows: 13 marginal, 7 small, 15 semi medium and 6 large. It will not be out of place to mention here that some of these farmers have their own land holdings are very small but the operational land holdings are semi medium (2-4 ha.) or medium (4-10 ha.) in size as they lease in some land to make their operational unit economically viable.

The sample includes farmers of all shade such as those who cultivate only wheat and maize, those who do diversified farming including cultivation of spices, aromatic and medicines plants, those who cultivate vegetables, mainly potato along with maize and wheat; those who cultivate maize, wheat, rice etc. More than 60 per cent of the farmers have 100 per cent irrigated land and about 10 per cent farmers have 100 per cent unirrigated land and about 30 per cent farmers have both irrigated and unirrigated land.

The Main Findings

The main findings of this survey are as follows:

- Out of 47 farmers only five farmers have no source of irrigation. The main source of irrigation is tubewells, both government and private. About one third of the farmers have their own tubewells, and about same proportion of the farmers get irrigation water from government tubewells. In addition to that about 13% of farmers have their own tubewells and also have access to government tubewells. One farmer each get water for irrigation from bore well (operated by diesel engine), lift irrigation scheme and check dam. Some of the farmers who get water from their own or government tubewells also have additional borewells. Some of them also have more than one tubewell.

- About half of the farmers (22 out of 47) have their own tractors. Infact two farmers have two tractors each.
- All tractor holders have operational holdings larger than 2 hectare.
- All tractor holders also have other agricultural implements. The detail of those implements is as follows:

Zero-till drills-8	Wheat thresher-17
Sowing drills-8	Maize thresher-9
Tillers -14	Potato planter-10
Harrows /Disks – 1	Potato Digger -2
Ridge maker-4	Power Spray Pump-10
Land levelor -16	Spray Pump-27

Power spray pump and hand or foot operated spray pump are the only implement which were available with farmers who do not own tractors.

The modern agricultural implements/machinery like Rotavator, Happy Seeder, tractor operated Reaper, Harvesting combine are not owned by any farmer as these are very expensive.

The fact that nearly half of the farmers own tractors and other agricultural equipment and many farmers have reported that they make use of tractor and other equipment by hiring these, suggest that level of farm mechanisation in the district has improved a lot.

- To our querry whether the farmer has any plan to harvest rain water, 2 farmers (one from village Panjawar and another from Jadla Keori reported that they have constructed structures to harvest rainwater /Khad water.
- To bring more area under irrigation only one farmer from village Badhera Rajputan reported that he is planning to install tube well on his land. Another farmer from the same village reported that his land can get irrigation water from government tubewell if provision of underground pipes is made by the department. Another farmer from Bruhi reported that he has installed sprinkler system to irrigate more land with the same amount of water.
- For the more efficient use of irrigation water, some farmers have reported that they want to level their land. Some have reported that they plan to install underground pipes for water conveyance system. One respondent farmer each from villages Bruhi, Jadla Keori, Badhera, Isspur, and Salohi reported that they are planning or are willing to reinstall sprinkler system of irrigation but they are facing financial difficulties.
- To our quarry that whether they have any plan to make any changes in the present cropping pattern the response is very poor. Only two farmers reported that they have a plan to change their cropping pattern. One farmer reported that the plan to bring more area under vegetable cultivation because he thinks that returns from vegetable cultivation are much higher than from the cultivation of other crops. The

second farmer plan to plant fruit trees as he feels that threat from wild animals is less in case of fruit gardens. Most farmers have not reported the reason for not going for any change in cropping pattern. Only two farmers have given reason for that one has reported that he has no source of irrigation and the second one reported that since he is already practioning diversified farming, so he does not feel the need for any change in his cropping pattern.

- It has been reported that almost all farmers are applying Farm Yard Manure to their lands, especially for the cultivation of main crops that is Maize and Wheat, as well as for Potato and other vegetables.
- Out of the 47 farmers only one farmer reported that he is not using chemical fertilizers.
- Only 2 farmers reported that they are using Green Manure to restore the fertility of soil.
- Only 4 farmers reported the use of Vermi-Compost and 2 farmers reported use of Bio-ferlizers in small quantity.
- About 20 per cent of the farmers reported the use of Zinc.
- DAP is used as a basal dose and urea for top dressing in case of wheat, maize, paddy potato and some other crops.
- A very few farmer use the quantity of fertilizers for basal dose and top dressing as per the recommendations of the agricultural scientists. Most farmers use 40-50% less than the recommended quantity of DAP for basal dose and 50-100% more than the recommended quantity of urea for top dressing.
- Chemical fertilizers are used almost in equal quantity on crops cultivated under irrigated as well as unirrigated conditions.
- Whereas basal dose of fertilizer in case of wheat is applied through drill, for other crops broadcasting method of application is used. For top dressing broadcasting method is used for all crops.
- Sowing of wheat is done mostly with the help of drill. A fairly large number of drills with the farmers also support this claim. But for the sowing of other crops broadcasting method is mostly used. In case of maize sowing, kera (dropping of seed in the furrows by hand) method is used. Some farmers are also growing maize on ridges. In such cases seed is sown on the ridges with hand.
- Most farmers are using newly developed HYV seeds of wheat like PBW-343, UP-2338 etc. In case of maize both local as well as HYV/improved varieties of seed like Kanchan, Hishell, and Pioneer etc. is used. In case of paddy also local as well as HYV seed are used. In case of potato the farmers are using only improved varieties of seed.
- Only about one third of the farmers take credit from PACs, and only about one fifth from commercial banks. The most common source of credit for farmers is Commission Agents/Artias. More than 40 per cent of the farmers reported that they

take loan from the Artias and the range of the loan amount is between Rs 10,000 to Rs 3,00,000.

- Farmers generally try to get certified seed but some times they also use uncertified seeds for wheat, maize and other crops.

Conclusion

From the discussion above it emerge that with the increase in area under irrigation, farm mechanization in the district has increased. Although the use of chemical fertilizers for the restoration of soil fertility has become almost universal yet its use is still under limits. Instances of overuse of chemical fertilizers are very few. It is also very heartening that almost all farmers are still applying farm yard manure to their soils. Farmers are also becoming conscious of the use of micro nutrients, vermi-compost, bio-fertilizers and green manure for the restoration of soil health. The awakening among farmers for the need of harvesting rain water and judicious use of available water by adopting sprinkler method of irrigation and use of underground pipes etc. is also increasing. Similarly farmers are adopting improved/HYV seeds for most of their crops. However some gaps do remain with the use of fertilizers for basal dose as well as for top dressing.

Existing Institutional Mechanism in the Government Sector

The following departments/institutes are looking after the development of agriculture sector in the district:

1. Agriculture Department

The Agriculture Department in the state is functioning under the leadership of Director, Department of Agriculture, Himachal Pradesh. The department at the district level is headed by Deputy Director, Agriculture. He is assisted by officers of various ranks. The Department has a total strength of 133 sanctioned posts, out of which 47 posts (35.3 % of total posts) are vacant. The main functions of the department are as follows:

- Implemntation of all the centrally sponsored and the state sponsored schemes relating to agricultural development;
- Development of agriculture;
- Enhancing agriculture production;
- Promoting diversification; and
- Capacity building of farmers about new practices i.e. INM, IPM, organic farming, mechanization, efficient use of water through drip and sprinkler irrigation

2. Soil Conservation

After the formation of Una district in November 1972, the department of Agriculture established the office of Assistant Soil Conservation Officer here, later on it was redesignated as Sub Divisional Soil Conservation Officer (SDSCO). The main function of

the soil conservation office is to promote soil conservation facilities by providing irrigation facilities for enhancing the agricultural production and diversification of agriculture towards cash crop. The irrigation facilities are provided by installing lift irrigation and minor irrigation schemes and constructing water harvesting structures. The department provides 100 per cent subsidy to community based irrigation works and 25 per cent subsidy for individual based irrigation works to small and marginal farmers of all categories. The farmers, who are getting benefits from the irrigation schemes, are showing keen interest towards the cultivation of high value cash crops, resulting into improvement in their economic condition with more income from these crops.

3. Krishi Vigyan Kendra (KVK)

The main aim of Krishi Vigyan Kendra is to reduce the time lag between generation of technology at the research institutes and its transfer to the farmer's fields for increasing productivity and income from agriculture and allied sectors on a sustainable basis. KVK holds training programmes for the farmers at its campus and also conducts demonstrations on the fields of farmers to educate them about the latest farming and farm management technologies and practices.

As on September 2006, the staff strength of the KVK Una was 14, (Scientific (5) + technical (3) + Administrative (2) + Supporting (4). During 2005-06, total sanctioned budget was 78.12 lakhs, but the actual released amount was 72.92 lakhs and expenditure was 77.92 lakhs.

The funds are being utilized under Field Level Demonstrations (FLD) on oilseeds and pulses. In addition the KVK do benche mark survey of selected villages and identify problems and prospects of agriculture and allied activities in those villages. On the basis of surveys, the KVK identifies the gaps in technology adopted by farmers. The following activities have been undertaken to fill up the gaps:

- Introduction of new varieties of maize (PSCL-4642) PSCL-4640, KH-101), wheat (PBW 343, UP 2338, HPW-184), Okra vegetable (p-8, Pusa purple Long, Pusa purple Cluster, Pusa Kranti) Onion (Patna red), Peas (Arkal) Cauliflower (snow white) Fodder/Grasses (Hybrid Napier, Setaria, Guinea grass);
- Popularisation of vegetable cultivation;
- Planting of fruit plants and inter cropping there in;
- Animal health care; and
- Income generating activities (soft toy making, bee-keeping and mushroom).

4. Cooperative Organizations

(i) Indian farmers Fertilizer Cooperative (IFFCO)

The main function of the IFFCO is to produce and market quality fertilizers. It ensures the supply of quality fertilizers at farmers' doorstep through cooperative societies and farmers service centres.

(ii) Co-operative Department

The formal financial institutions particularly, the Commercial banks, the Co-operative banks and the Rural Regional Banks have played a significant role in the development of rural economy in the country. These institutions are crucial for the implementation of the strategies, chalked out to speed up the growth of the agricultural and allied activities. The banks, both commercial and cooperative, are disbursing short and long term credit to farming community to purchase farm machinery and other inputs for increasing agriculture production and to decrease unnecessary variable costs. Una district has 219 Primary Agricultural Co-operatives Societies (PACSs), 4 Agricultural Development Banks

5. HIMFED

Himachal Pradesh State Co-operative Marketing & Consumers Federation Ltd (HIMFED) plays a very crucial role in the development of agriculture in Himachal. HIMFED helps farmers by supplying and distributing fertilizers and agro-chemicals through co-operative societies. HIMFED performs these activities through its Area Manager as district head and its field staff i.e. accountants, store keepers etc.

6. National Bank for Agriculture and Rural Development (NABARD)

NABARD was set up by the Government of India as Development Bank with the mandate for facilitating credit flow for promotion and development of agriculture, small scale industries, cottage and village industries, handicrafts and other rural crafts. It also supports all other allied economic activities in rural areas. Besides other agriculture development programmes, NABARD has financed 31 irrigation schemes (Water Harvesting Structures, Lift Irrigation Schemes, Shallow Tubewells and Flow Irrigation Schemes) to be constructed through Rural Infrastrucral Development Fund (RIDF) scheme. All the schemes have been completed during the period of 2000 to 2008

7. Department of irrigation- cum- Public Health

The department is responsible for Operation and Maintenance (O&M) and execution of water supply, irrigation and sewerage schemes and flood control works. Out of 12 AIBP irrigation schemes under centrally sponsored schems, 6 schemes have been completed and 6 were in progress during the period 2005 to 2008. 38 minor irrigation schemes were in progress during the same period (Command Area Development Programme). In addition

to this out of total 17 state irrigation schemes financed by NABARD, 3 schemes have been completed and 14 were in progress during 2005 to 2008

8. Himachal Pradesh State Electricity Board (HPSEB)

As already mention, the irrigated area in the district is around 21 per cent of net sown area. The major sources of irrigation are tubewells, lift irrigation, tanks, wells, flow irrigation etc. Out of these sources, the highest area is irrigated by tubewells. Una electricity Operation Circle (OC) is feeding power supply to 2800 tubewells, installed in different villages of Una, Amb and Gagret divisions of electricity board.

9. Agriculture Marketing

The Himachal Pradesh State Agriculture Marketing Board regulates the marketing of agriculture produce in the district. The Agricultural Produce Market Committee, Una has 14 sanctioned posts, out of which, 3 are vacant. There are the posts of Secretary Market Committee, Junior Engineer and auction records. The main functions of the department are as under:

- Marketing of agriculture produce, vegetables, fruits, fisheries, animal husbandry and other allied products scheduled to the State Marketing Act 2005;
- Provision of better infrastructure facilities to the farmers;
- Liaison with other departments on agricultural concerns;
- Issue of licenses for the grains, fruits and vegetable traders; and
- Organisation of training camps for better marketing of Agri-Horti produce.

Income Analysis of Farming Households

During the ninties, the per capita income in Himachal Pradesh grew at an annual rate of 3.8 per cent. It was the highest in Una district (7.21 per cent) closely followed by Solan (7.11 per cent). Regional disparities in terms of per capita income in all districts decreased during the decade of the ninties.

The present income analysis is based on the data of ATMA report, collected from 4 representative villages falling in all the four AESs of Una district and the information, provided by the farmers during the informal interactions with them and the inferences drawn from the general productivity level of different crops in the district and their Minimum Support Prices (MSP). The data show that almost 42 per cent of total geographical area is cultivated area in all the representative villages.

As mentioned earlier, wheat and maize are the main crops and paddy is grown ona very small area. Per hectare productivity of maize is higher in AES-I, than the other ones, wheat productivity is more in AES-III. In case of potato, the productivity is more in AES-I & II. Cucurbits productivity is high in AES-III than the other ones. Productivity of

horticulture crops is almost equal in all the four AESs but slightly more in AES-I & II. The milk productivity of local breed milch animals is equal in all the four AESs, but of the graded buffaloes it is more than double in AES-II.

So far as the resource poor families are concerned. AES-II has almost 95 percent families which are resource poor, followed by AES-I (87 percent), AES-III (75 percent) and AES-IV (67 percent).

The ATMA study reveals that in AES-I, AES-II, AES-III and AES-IV, the percentage of families which have adopted Agri+ Animal Husbandry+ Horticulture system is 29.4, 25.0, 31.3 and 40 per cent respectively where as the proportion of families which have adopted agricultural and animal husbandry is 70.6, 75.0, 68.7 and 60 per cent respectively. The per household annual income of families which have adopted Agri+ Animal Husbandry+ Horticulture system is Rs 15761, while of those which have adopted the traditional occupational system of Agriculture + Animal Husbandry is Rs 3115. It study also revealed that per household income of families which have adopted Agriculture + Animal Husbandry + Horticulture in AES-I and AES-IV is Rs 42,778 and Rs 83,333 respectively and in AES-II & III is Rs 10,824 and Rs 9,467 respectively.

4.10 Recommended Interventions

Bring more area under cultivation

The district has about 6 thousand hectares of cultivable waste land, about 3500 hectares as other fallows and about 2420 hectares as current fallow. These lands which are equivalent to almost one third the size of net sown area of the district are potential areas for the extension of cultivation. In addition to these lands, channelisation of river Soan will make available a very large area along the river for cultivation which at present, being a part of the river channel, is uncultivable waste land. Extension of cultivation to these lands of course will not be an easy task. It may require clearance of these lands of thorny bushes and weeds, leveling or terracing, construction of rainwater harvesting structures, removal of boulders etc if any, checking soil erosion and extending irrigation. All this will require huge capital investment. Effort should be made to bring about 500 hectare of these lands under cultivation every year. These targets can be increased/decreased depending upon the availability of funds. This additional area can contribute 1-1.5 % increase in the total production of the crops.

Improving Soil Health

As pointed out earlier (Section 4.3) the soils in the district suffer from a number of problems like soil erosion, undulated land surface, alkanity/salinity in some pockets, low level of fertility, etc. To overcome these problems the following plan of action is proposed:

- Upgrade/strengthen the soil testing labs to assess the soil health status of every field;
- Assess the status of major (NPK) and micro nutrients in the soil and apply fertilizers and micro nutrients as per requirement;
- Promote use of green manure, farm yard manure, vermi compost and bio-fertilizers to improve the level of organic matter in the soil; and
- Reclaim alkaline/saline soils by applying gypsum @ one ton per hectare every year.

Improving the availability of water for Irrigation

Only about 23 % of the net sown area in the district is irrigated. There is a need to bring more area under irrigation. Since irrigation is the most critical input for higher productivity of land, this sector should get very high priority in the allocation of funds. Apart from exploiting the ground water and lifting the water from reservoirs, efforts should be made to harvest the rainwater for irrigation to the maximum extent. The task of water harvesting can be undertaken under watershed management programmes. A detailed plan for water harvesting and extension of irrigation be formulated and steps be taken for its execution.

Promoting water saving methods of Irrigation

Judicious use of available water for irrigation is as important as increasing the availability of water for irrigation. Generally flooding method is used for irrigation. It requires a lot of water, especially if the soils are sandy. Numbers of water saving methods of irrigation are now available which can be adopted for more judicious use of irrigation water. Some of these methods are as follows:

- **Land Leveling:** It is claimed that precision leveling of fields by laser levelor can save 15-20 percent of water.
- **Underground Water Conveyance System:** There is a considerable loss of water when it is carried to the fields through surface channels. The loss is generally due to seepage and spilling or breaches in the channels. The loss of water is comparatively more in sandy areas. It is claimed that underground water conveyance system can save 25-30% water.
- **Micro Irrigation System:** The utility of micro irrigation system as a water saving device, particularly in orchards and vegetable cultivation, need no emphasis. But the system is very costly. It costs about Rs. 50,000 per hectare for orchards and Rs. 70,000 per hectare for other crops. The system is ideally suitable for hilly areas of Una district particularly for orchards, vegetable cultivation and development of pastures.
- **Agronomic Practices:** Certain agronomic practices, like cultivation of wheat on raised beds, cultivation of vegetables and certain crops on ridges and use of early

maturing and less water requiring varieties of seeds can also save considerable amount of water.

- **Mulching:** Mulching is also a very effective method of water saving as it checks evaporation of soil moisture.

In the light of observations made above the following plan of action is suggested:

- Farmers be advised to level their lands properly. Financial assistance @ Rs. 10,000 per hectare be provided for this purpose.
- Underground water conveyance system be promoted in the district. Subsidy @ 50% of the cost be provided to the farmers.
- To promote micro irrigation system in the district, subsidy @ 75% of the cost be provided for installation of drip/sprinkler system of irrigation.
- Farmers need to be educated about the benefits of using mulch for the preservation of soil moisture. Mulch also check the growth of weeds.
- The department of agriculture should hold awareness camps about water saving agronomic practices.

Promoting Farm Mechanization

Farm mechanization helps in the timely completion of production operation, effective management of inputs, optimum utilization of irrigation potential and multiple cropping. Its role in reducing the drudgery from the life of farmers needs no emphasis. Because of small land holdings and undulating topography in most of the district, level of farm mechanization in Una is low. Since most modern farm machinery is very expensive, cooperative societies be encouraged to purchase this machinery which then could be provided to the farmers for use on reasonable rent. The cooperatives be provided 50 % subsidy for the purchase of modern farm machinery.

Encouraging Seed Replacement and Seed Treatment

Productivity of crops depends to a great degree on the quality of seeds. High Yielding Varieties of seeds of various crops give much higher yields compared to local and old varieties. The agricultural scientists also recommend that for higher yields, seeds of even HYVs should be replaced after 3-5 years because their yield starts declining after 5 years.

Agricultural scientists also recommend that seed, particularly that of wheat, must be treated before sowing. It costs about Rs 250 per quintal or Rs 100 per acre, but the benefits to the farmers in terms of enhanced yield and savings on pesticides etc are much higher.

It is therefore recommended that:

- The maximum area under wheat, maize, paddy, oil seeds, pulses, millets and fodder crops be brought under HYV/improved seeds. These seeds be provided to the farmers on subsidized rates.
- Seed replacement in a cycle of 5 years be done. Seed replacement on 6000 hect. of wheat and 5000 hect. of maize should be carried out every year. A subsidy @ Rs 500 per hectare be provided for the purchase of new seeds.
- The seed treatment chemicals comes in small kits meant for treatment of 40 kg seed (required for 1 acre). This kit costs about Rs 100. To demonstrate the usefulness of seed treatment, this chemical be provided to the farmers on 50 % subsidy. To cover maximum number of farmers, each farmer should be provided only one kit of chemical on subsidized rate.

Promoting balanced Use of Chemical Fertilizers

Since the soils in Una district are deficient in major and micro nutrients as well as organic carbon, use of chemical fertilizers to maintain crop productivity becomes unavoidable. In their quest for higher productivity farmers are some times tempted to use over doses of chemical fertilizers which proves rather harmful for the health of soils. Thus there is need to educate the farmers about the balanced use of chemical fertilizers.

Promoting Integrated Pest Management (IPM) Techniques

IPM is a technique to control pest population by using all means like cultural and mechanical methods and increasing the population of natural enemies with the aim of reducing insecticides use while maintaining profitability, yield and quality of the produce. A good IPM programme would result in good integrated crop management.

Although use of insecticides in Una district is very low, yet there is a need to educate the farmers about the effective IPM techniques for the control of pests, particularly about the use of bio-pesticides and biological control of pests.

Subsidy @ 50 % may be provided on the purchase of bio-pesticides, spray pumps, storage bins etc.

Promoting Organic Farming

There is a good scope for organic farming in Una district. Already farmers are using a very small amount of chemical fertilizers, pesticides and weedicides. Moreover, because of hilly/undulating terrain most of the toxins produced by chemical fertilizers, pesticides and weedicides used get washed away from the soils during the rainy season. Thus organic cultivation of desi wheat, desi maize, basmati rice, sugarcane, pulses, oil seed, fruits and vegetables can be promoted in certain pockets of the district. For that the following plan of action may be adopted:

- Procure about 400 qt of seed of suitable variety of desi wheat from some reliable source.
- Prepare mini kits of 5 kg each from the procured seed.
- Distribute mini kits of desi wheat among progressive farmers to produce their own seed for the next season.
- Motivate farmers to adopt organic farming of wheat on an area of about 400 hectares per year.
- Subsidy @ Rs 750 per quintal be provided for the purchase of seed of desi maize.
- Mini kits of pulses and oilseeds are already provided to the farmers under ISOPOM programme. Some of the farmers may be motivated to undertake organic cultivation of pulses and oilseeds.
- Some assistance may be provided for the purchase of Farm Yard Manure (FYM), vermi-compost, bio-fertilizers, bio-pesticides etc to the farmers who opt for organic farming.
- Department of agriculture and KVK Una should educate and guide the farmers about the modern methods of organic farming of different crops.
- State agencies like HIMFED should monitor the cultivation of organic crops and procure the produce from the farmers at remunerative prices as is being done by HAFED in Haryana.

Promoting Crop-Diversification

Although a large variety of crops are grown in Una district, a virtual monoculture of maize and wheat prevails during Kharif and Rabi seasons respectively in the district. In 2007-08 maize occupied about 43% of total cropped area while wheat accounted for nearby 46% of the total cropped area. Paddy occupied only about 3% of the cropped area. Other crops like pulses, oilseeds, sugarcane, vegetables and fodder occupied only a small proportion of the cropped area. The wheat-maize-rotation over a prolonged period of time is harmful to the health of soils. Since Himachal Pradesh is a foodgrain deficit state cultivation of wheat, maize and paddy will always remain a priority in the cropping pattern of district Una. However some shift of area under maize and wheat to other crops such as paddy, sugarcane, pulses, oilseeds, vegetables and aromatic medicinal plants will be in the interest of farmers as well as soil health.

Since paddy occupy only about 3% of the total cropped area, effort should be made to bring more area under it. The channelisation of Swan river is going on and some land is being reclaimed in this process. Most of this reclaimed land is suitable for paddy cultivation. In addition to that possibility of expanding area in those villages where paddy is already cultivated (see map 4.3) as well as in other villages where irrigation facility exist should be explored. Likewise possibility of bringing more area under pulses, oilseed and sugarcane should be explored in the villages where these crops are already cultivated

(see maps 4.4 and 4.5). There is a need to educate the farmers about the economics of cultivation of these crops. The prevailing prices of pulses, oilseeds and sugarcane in the market have made the cultivation of these crops highly profitable. However it is possible that farmers may be facing some problems like non availability of quality seed, problem of uncontrollable diseases and pests, menace of stray and wild animals or even marketing of the produce, because of which they are reluctant to takeup the cultivation of these crops. Satisfactory solutions to those problems have to be found. Thus concerted efforts are needed to promote crop-diversification. Since the area under these crops is too small, both in absolute as well as relative terms, the target should be to double the area under these crops at the cost of area under wheat and maize in five years.

Improving marketing and Storage Facilities

Una district has only one regulated market yard which is located at Una town, and one sub yard at Santoshgarh. During the field survey by these team farmers from certain areas of the district reported that they face problems in the marketing of their surplus produce as the marketing infrastructure in the district is very weak. Farmers want upgradation of marketing facilities at Una and Santoshgarh and provision of marketing sub-yards at all the block headquarters. The upgradation of marketing infrastructure also includes provision of godowns for storage purpose.

Reducing Post-harvest Losses and Value Addition to Agricultural Produce

To increase profit of the farmers, reduction in post-harvest losses and value addition to agricultural produce is a must. For that the following action plan is proposed:

- Modernize agricultural markets and improve existing infrastructure and facilities in them;
- Increase storage capacity;
- Organize awareness camps in the villages to educate the farmers on the methods of reducing post-harvest losses; and
- Promote agro-industry in general and agro-food industry in particular in the district.

Promoting Agriculture Extension Services

The extension services provided by the Department of Agriculture play a most critical role in the development of agriculture. These services bridge the gap between the lab and the fields of the farmers. They carry the latest knowledge generated and breakthrough made by the agricultural scientists in the labs and experiment farms to the agricultural fields. These wings try to narrow down the gap between the existing agricultural practices and the recommended agricultural practices. Their efforts are also augmented by the KVK centres.

The efficiency of the extension services depends upon (a) the strength of the staff, (b) capability of the staff and (c) infrastructural facilities and funds available with the staff. Thus to improve the agricultural extension services in Una district following need to be done.

- Fill all vacant posts, if any, of the extension wing of the department and KVK Una.
- To update their knowledge and upgrade their skill, the staff has to be sent regularly to attend training programmes, workshops, seminars, orientation courses, field visits to different areas for exposure, etc. Adequate funds have to be earmarked for this purpose.
- Adequate infrastructure and funds have to be provided to the staff to carry out training/awareness camps for the farmers, set demonstration plots at fields of the farmers, lay frontline demonstration plots to assess the performance of new crops or various varieties of seeds at the fields of the farmers etc.

Improving agricultural Credit

Provision of credit on easy terms is the backbone of any economic activity and agriculture is no exception. According to some estimates,

On the basis of interactions with farmers and other stakeholders it was found that almost one fourth of financial requirements of farmers in Himachal Pradesh are met by the non-formal financial institutions and the remaining by the commercial banks and co-operative banks. To improve agri-credit flow in the district, the following plan of action is proposed:

- The facility of Kisan Credit Cards should be extended to all the farmers.
- Per acre limit of crop loan should be increased and maximum limit of loan should also be increased in the same ratio.
- Performance of cooperative banks in agri-loan should be improved.
- The banks should simplify their procedures to advance loans to the farmers. They should also float some innovative and farmer friendly schemes
- Credit from informal financial institutions should be made transparent and they should not be allowed to charge more than the agreed rate of interest.

4.11 Projected Outcome and Growth Rate during the Plan Period

The interventions recommended above have short term goals and long term aims. The short term goals of these interventions are:

Bringing more area under cultivation

The district has a very large area under culturable waste land, current fallow & other fallows and uncultivable waste land in the bed of river Swan which is likely to become culturalable waste after the channelisation of the river. An additional area of 2500 ha. will

be added to the net sown area in span of 5 years if the recommended target of 500 ha. per year is maintained for the reclamation of above said lands for agricultural purposes.

Bringing more area under irrigation

Irrigation being the most critical input for agricultural productivity has always received a very high priority in the development plan of any area, so is also true in case of Una district. The government has already completed number of small and medium irrigation project in the district and work is ongoing any many others. Most of the area is being irrigated by tubewells (both private and government) and lift projects. A very small area is irrigated by surface water (through kuhals). It is expected that efforts to bring more area under irrigation will continue in the district. According to some estimates the district has irrigation potential for about 4400 hectares out of which about 96 % of the area is in Una and Amb blocks. If about 400 hect. of this potential is exploited every year, the district will have 2000 hect of additional net irrigated area after 5 years. In addition to that use of water saving methods of irrigation can spare water to bring some more area under irrigation.

Increasing yield of wheat, maize, paddy and other crops

If the interventions suggested earlier, like seed replacement on about 20 % of the area every year, replacement of local varieties of seed with HYV seeds, more judicious use of water for irrigation, balanced use of fertilizers, mechanization of farming operations, etc. are carried out as recommended, it can result in a significant increase (between 20-30 %) in the yield of these crops.

Diversification in cropping pattern

Concerted efforts for diversification in cropping pattern can result into 100 % increase in area under paddy, pulses, oilseeds, sugarcane, vegetables, spices, aromatic and medicinal plants in five years. The area under fruits and vegetables cultivation can also experience 20-25 % increase in five years.

Improvement in the agricultural marketing infrastructure and storage facility

Significant improvement in the agricultural marketing infrastructure and storage facility at Una and Santoshgarh is expected. Constructions of marketing yard at some of the block headquarters are also expected.

Organic farming

It is expected that a fairly large number of farmers will takeup organic farming of desi wheat, desi maize, basmati rice, pulses, oilseeds and sugarcane. Significant area will come under these crops for organic farming.

Agricultural Credit

Role of institutional credit, particularly that of cooperative bank will increase.

4.12 Researchable Issues

Following are the main researchable issues relating to crop sector of Una district:

- Study of soil health status in the district at the individual field level. Based on the findings soil health cards for each field be issued to the farmers. The status of soil health be evaluated at regular time interval.
- Development of most appropriate package of agronomic practices for the cultivation of each crop under rainfed conditions.
- Development of new varieties and identification from among the existing varieties of seed of maize and other kharif crops which can be sown successfully in case of delayed monsoons and which can withstand the stress of long spells of drought.
- Developing early sowing varieties of wheat, maize and other crops.
- Testing the suitability of new varieties of seeds of wheat, maize, paddy, sugarcane, pulses, millets, oilseeds etc developed by the agricultural universities and other research centres in the region, in the different Agro-Ecological Situations of the district.
- Developing new varieties of seed of wheat, maize, rice and other crops which are resistant to common diseases of these crops, like Karnal bunt and rust in wheat, bacterial stalk rot in maize, blight and pod borer in case of gram and lentil, etc.
- Developing new varieties of seed of wheat, maize, rice and other crops which require less number of irrigations and take less time in maturing.
- Identification of appropriate HYV seeds of maize, wheat and other crops for different AESs. Under rainfed conditions as well as under irrigation conditions.
- Feasibility studies of cultivation of spring maize, baby corn, sweet corn, different varieties of barley etc in different AESs of the district.
- Developing area specific water saving methods of irrigation.
- Identification of suitable sites for constructing rain harvesting structures in the district.
- Refining techniques of compost making.
- Developing efficient soil conservation techniques for different areas of the district.
- Studies regarding economics of cultivation of different crops and cropping systems under irrigation and rainfed conditions in different AESs of the district.

Chapter-V
Allied Agriculture Sectors

5.1 Introduction

Horticulture, animal husbandry, dairy, poultry, fisheries, sericulture, forestry and agricultural marketing are the allied sectors, contributing substantially in the agricultural growth of the district. National Horticulture Mission started in 2005 has extended the scope of horticulture beyond fruits and vegetables to medicinal plants and spices. The recent growth of these crops has been relatively high and export prospects are good. The livestock sector provides full time or part time employment to a considerable percentage of working population. The poultry development has shown better progress over the years, primarily because research and development schemes of the government have been complemented with effective management and marketing by an organized private sector. The fishery sector has vast potentials for providing employment to the fisher folk. This assumes greater importance in the district as there is a rising demand for allied sectors products due to rapid industrialization and urbanization in the state as well as in the neighbouring states.

The state government, in its 11th Five Year Plan (2007-12) document, has fixed the target growth rates for the allied sectors at much higher levels. The annual target growth rates for fruits and vegetables production are 6 per cent each (30 per cent increase, for each, in five years plan period). The annual target growth rate for mushroom production is almost 4 per cent and milk more than 1 per cent, fish production almost 80 per cent. Likewise, the National Horticulture Mission aims to double the production of fruits and vegetables in the country by 2011-12.

5.2 Development of Horticulture

Horticulture includes cultivation of fruits, vegetables, spices, aromatic & medicinal plants, flowers and mushrooms. Horticulture sector is being promoted in the state in enhance the income of the farmers and also to promote diversification in the cropping pattern. As per the available data for the year 2007-08, district Una has about 5000 hectare of land under fruits 1392 hectare under vegetables, 49 hectare under spices, aromatic and medicinal plants, and about 30 hectares under flowers.

Himachal Pradesh is a major Horticulture state where horticulture crops command a sizeable area and are the main-stay of the vast majority of small and marginal farmers. A wide range of fruits like apples, pears, stone fruits, mangoes, citrus, nuts and a variety of vegetables, especially potato, tomato, capsicum, peas etc. are grown. Horticulture Technology Mission (HTM) and subsequently the National Horticulture Mission (NHM) have provided the much neded financial support for strengthening the horticultural activity

in the state. District Una received Rs 330.26 lac from 2003-04 to 2007-08 (upto Dec. 2008) under the Horticulture Technology Mission for the integrated development of horticulture. The detail of the recived funds is provided below in table-5.1. The table shows that the district received Rs 19.36 lac in 2003-04 which was raised to Rs 38.40 lac in 2004-05, to Rs 58.59 lac in 2005-06 and to Rs 108.35 lac in 2006-07. This shows that every year there was a substantial increase in the funds provided for the development of horticulture in the district. This indicates that the importance of horticulture sector in the economy of the district is increasing and the development of this sector is being accorded a very high priority.

Table-5.1
Financial Assistance under Horticulture Technology Mission (HTM) (Rs. In lakh)

S. No.	Name of component	Year									
		2003-04		2004-05		2005-06		2006-07		2007-08 till Dec. 2008	
		Funds received	Funds Utilized	Funds received	Funds Utilized	Funds received	Funds Utilized	Funds received	Funds Utilized	Funds received	Funds Utilized
1.	Area Expansion										
	(i) Fruits	2.60	2.60	5.20	5.20	6.50	6.50	14.45	14.45	11.99	1.80
	(ii) Vegetables	0.65	0.65	6.50	6.50	7.80	7.80	8.775	8.775	14.30	2.18
	(iii) Leaf vegetables	-	-	-	-	-	-	-	-	1.84	-
	(iv) Floriculture	1.65	1.65	-	-	1.30	1.30	2.34	2.34	1.30	1.30
	(v) Spices	-	-	2.60	2.60	1.69	1.69	1.04	1.04	1.43	1.43
	(vi) Medicinal plants	-	-	1.30	1.30	-	-	-	-	-	-
	(vii) Aromatic plants	-	-	0.25	0.25	-	-	-	-	-	-
2.	Creation of water sources										
	(i) Water storage tanks	5.00	5.00	5.00	5.00	9.00	9.00	11.00	11.00	6.00	1.00
	(ii) Bore wells	3.125	3.125	2.75	2.75	6.25	6.25	8.50	8.50	5.00	5.00
3.	On farm water management										
	(i) Drip Irrigation	0.57	0.57	2.85	2.85	2.48	2.48	0.855	0.855	1.14	1.14
	(ii) Sprinkler irrigation	-	-	-	-	6.00	6.00	1.80	1.80	3.00	3.00
	(iii) Anti hail nets	-	-	-	-	0.50	0.50	-	-	-	-
	(iv) Green houses	0.72	0.72	-	-	2.40	2.40	1.00	1.00	1.88	1.88
	(v) Shading nets	-	-	0.35	0.35	0.07	0.07	0.35	0.35	-	-
	(vi) Plastic Mulch	-	-	0.70	0.70	-	-	-	-	-	-
	(vii) Low tunnels	-	-	0.25	0.25	0.10	0.10	-	-	-	-
	(viii) Green houses (high tech.)	-	-	-	-	-	-	-	-	4.88	4.88
4.	On farm handling unit										
5.	Production of planting material										
	(i) Estt. of herbal gardens	-	-	-	-	3.00	3.00	-	-	-	-
	(ii) Small nurseries (Public)	-	-	3.00	3.00	-	-	3.00	3.00	3.00	-
	(iii) Big nurseries (Public)	-	-	-	-	-	-	18.00	17.00	-	-
	(iv) Small nurseries (Private)	-	-	-	-	-	-	-	-	3.00	-
6.	Popularization of Agri. Equipments										
	(i) Manual operators	0.90	0.90	0.075	0.075	0.15	0.15	1.275	1.275	0.60	0.60
	(ii) Power operators	0.45	0.45	-	-	0.25	0.25	0.55	0.55	1.50	1.50
	(iii) Power tillers	0.90	0.90	-	-	0.90	0.90	5.40	5.40	4.50	-
	(iv) Diesel engines	-	-	-	-	0.45	0.45	0.90	0.90	-	-
7.	Organic farming										
	(i) Adoption of organic farming	-	-	1.00	1.00	0.50	0.50	3.20	3.20	2.00	2.00
	(ii) Vermi compost units	-	-	1.20	1.20	2.25	2.25	15.30	15.30	3.00	3.00
8.	Transfer of technology										
	(i) Training with in state	0.60	0.60	3.00	3.00	3.00	3.00	3.055	3.055	0.75	0.75
	(ii) Training outside the state	1.00	1.00	1.00	1.00	1.50	1.50	3.50	3.50	1.00	1.00
9.	Women development										
	(i) Training of women	0.40	0.40	0.80	0.80	1.00	1.00	-	-	0.40	0.40
	(ii) Self Help Groups	0.80	0.80	0.40	0.40	0.50	0.50	-	-	0.25	-
10.	Use of IPM	-	-	0.10	0.10	-	-	-	-	-	-
11.	Training at H.Q. level	-	-	0.08	0.08	-	-	-	-	-	-
12.	Tissue culture labs in private sector	-	-	-	-	-	-	-	-	10.00	10.00
13.	Estt. Of leaf analysis labs.	-	-	-	-	-	-	-	-	20.00	-
14.	Technical support	-	-	-	-	-	-	0.40	0.40	-	-
15.	District level meetings	-	-	-	-	-	-	0.08	-	-	-
16.	Block level meetings	-	-	-	-	-	-	0.20	-	-	-
17.	Beekeeping development	-	-	-	-	-	-	-	-	0.80	0.80
	Total	19.36	19.36	38.40	38.40	58.59	58.59	108.35	107.07	105.56	45.66

Source: Department of Horticulture, Una

Table-5.2
Status of Horticulture Development Programme in Una district

S. No.	Particulars	Unit	2005-06		2006-07		2007-08		2008-09 till Dec. 09	
			Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
1	Production of fruit plants in govt. nurseries	No.s	20000	17095	20000	24959	25000	51541	25000	-
2	Area of fruit plants like litchi, mango, plum, citrus fruits etc. taken under IPM control	No.s	600	600	600	600	600	600	600	200
3	Area under plant protection	No.s	1600	2190	1550	1875	1550	1750	1500	200
4	Organization of village level training camps	No.s	-	80	-	72	80	95	80	-
5	More area taken under fruit plantation	Ha	300	373	190	360	153	280	225	-
6	Distribution of fruit plants	No.	70500	82700	70500	116274	77000	106014	70500	-
7	Total fruit production in Una	MTs	-	5750	-	8260	-	7580	-	800
8	Benefits of floriculture equipments given to fruit growers under Specific Central Assistance Scheme	No.s	175	175	175	214	175	280	195	-
9	Benefits of fruit equipments given to fruit growers under Backward Area Sub Plan	No.s	-	-	-	-	-	30	-	-
10	Benefits of horticulture equipments to small & marginal fruit growers	No.s	-	151	-	-	-	-	-	-
11	Actual area under floriculture	Ha	5	7.45	10	19.4	5	5	30	-

Source: Department of Horticulture, Una

Table-5.3
Status of Horticulture Development (SC Special Plan) in Una

S. No.	Particulars	Unit	2005-06		2006-07		2007-08		2008-09 till Dec 9	
			Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
1	Area taken under plant protection scheme	Ha	1000	1075	500	530	1100	1110	1000	200
2	Organization of village level training camps	No.s	-	-	-	-	-	-	-	-
3	Area under fruit plants	Ha	40	40	50	42	-	-	34	-
4	Distribution of fruit plants	No.s	10000	9108	10000	8414	11000	8420	12000	-
5	Beneficial farmers under the distribution of fruit plants	Nos	-	891	-	788	-	730	-	-
6	Beneficial families under 20 point economic programme	Nos	360	364	400	409	400	403	450	-

Source: Department of Horticulture, Una

Table-5.4
Status of Horticulture Development (ST households living outside the area:) in Una

S. No.	Particulars	Unit	2005-06		2006-07		2007-08		2008-09(30-06-08)	
			Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
1	Distribution of fruit plants	Nos	-	-	-	942	-	-	-	-
2	Beneficial farmers	No.s	-	-	-	10	-	-	10	-
3	Beneficial fruit growers	Nos	-	-	-	45	-	502	-	-
4	Distribution of horticulture material	No.s	-	-	-	45	-	502	-	-
5	Organization of village level training camps	No.s	-	-	-	-	-	14	-	-
6	Beneficial fruit growers	No.s	-	-	-	-	-	360	-	-
7	District level training camps	Nos	-	-	-	-	-	7	-	-
8	beneficial farmers	Nos	-	30	-	28	32	32	-	-

Source: Department of Horticulture, Una

Table-5.5
Status of Horticulture Development (Backward area sub plan:) in Una

S. No.	Particulars	Unit	2005-06		2006-07		2007-08		2008-09 (30-06-08)	
			Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
1	Area taken under plant protection	Ha	-	35	-	55	-	40	-	-
2	Distribution of fruit plants	No.s	-	250	-	330	-	250	-	-
3	Beneficiary farmers	Ha	-	25	-	34	-	22	-	-
4	Distribution of horticulture material	No.s	-	-	-	30	-	7	-	-
5	Beneficiary farmers	No.s	-	-	-	30	-	7	-	-
6	Benefits of study tours to fruit growers	No.s	-	30	-	28	-	32	-	-

Source: Department of Horticulture, Una

(a) Fruit Cultivation

As per land use statistics for the year 2006-07, fruit orchards in Una district occupy 4987 hectares of area, which is about 2.6 % of the total geographical area of the district and is equivalent to about 13.5 % of the net sown area of the district. Because of vast variations in elevation, topography, soils and climatic conditions, a large variety of fruits are grown in the district. However, mango continues to be the most important fruit of this district. It accounts for about one third of the total area under fruits. Citrus, mainly Kinnow and lemon are also equally important as they also account for nearly one third of the total area under fruits. Pear is another important fruit of this district which account for about 15 % of the area. Litchi, guava, aonla and stone fruits are the other important fruits of this district. The table 5.1 shows the distribution of area under different fruits during each year from 2000-01 to 2006-07. The table 5.1 shows a very slow growth in the area under fruits. There was a total increase of only about 375 hect. in a span of 6 years, which comes to a total growth of only 8.2 % from 2000-01 to 2006-07. In fact there was a net decrease of about 160 hectares in the fruit area during 2005-06 to 2006-07. This decline was mainly due to decrease of about 319 hectares in the area under mangoes during that year. Why

does such a large decrease in area under mangoes took place in that year need to be investigated.

Tables-5.6
Area under different fruits in District Una (In Hectares)

S. No.	Name of crop	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
1.	Plum	86.00	84.00	81.20	80.22	81.67	82.2	83.0
2.	Peach	88.0	88.74	88.90	89.20	90.30	92.32	97.0
3.	Pear	763.0	772.71	744.60	743.60	746.57	748.92	745.0
4.	Pomegranate	42.63	43.44	59.00	59.14	61.33	62.53	45.50
5.	Strawberry	0.50	0.00	0.00	0.10	0.09	0.09	0.00
6.	Green Almond	114.90	110.48	111.25	109.00	89.00	80.00	80.65
7.	Orange/Kinnow	772.00	760.64	705.00	710.75	725.28	745.28	798.0
8.	Malta/Musambi	47.79	49.93	45.00	47.80	50.86	56.46	62.0
9.	K.Lime/B.Lemon	589.35	571.86	551.90	549.50	561.77	568.77	585.50
10.	Galgal	201.07	190.91	180.40	178.52	180.24	187.04	193.0
11.	Mango	1533.43	1664.37	1672.37	1755.60	1886.12	1986.82	1668.0
12.	Litchi	81.00	85.97	83.50	87.00	97.01	107.81	126.0
13.	Guava	166.35	162.52	154.00	158.10	162.35	167.05	164.0
14.	Aonla	27.02	25.00	38.20	42.90	69.17	84.17	123.0
15.	Jack Fruit	1.00	12.18	28.00	39.00	46.57	51.57	57.50
16.	Papaya	27.89	27.06	29.25	29.50	32.33	35.83	27.00
17.	Grapes	47.96	48.70	44.75	43.20	43.20	43.20	43.20
18.	Kiwi	0.06	0.6	0.6	0.00	0.00	0.00	0.00
19.	Banana	0.00	0.00	0.00	4.00	4.00	4.00	5.00
20.	Loquat	0.00	0.00	0.55	0.55	0.55	0.55	0.55
21.	Chikoo	0.24	0.20	0.45	0.00	3.12	5.52	10.62
22.	Jamun	0.00	0.00	0.00	2.20	2.59	2.59	13.50
23.	Grape Fruit	0.00	0.00	0.00	1.90	1.90	1.90	2.0
24.	Pecannut	8.15	7.15	6.50	6.50	6.61	9.16	12.50
25.	Walnut	8.00	11.15	10.20	10.00	10.00	10.00	10.00
26.	Persimmon	0.90	1.06	1.20	1.20	1.20	1.33	1.30
27.	Ber	0.07	1.81	1.31	1.31	1.31	1.31	6.30
28.	Karonda	1.26	1.00	1.00	1.00	1.00	4.96	5.70
29.	Deun	0.00	0.00	0.00	0.00	0.00	5.72	21.30
	Total	**4608.57**	**4700.935**	**4638.585**	**4751.79**	**4961.94**	**5146.92**	**4987.12**

Source: Department of Horticulture, Una

Table-5.7
Yearwise utilization of Funds under HTM Programme

Sr. No	Name of scheme	Amount of grant received (In Lakhs)			Actual of expenditure (In Lakhs)			Physical and financial targets achieved	Training/demonstration Camps organized
		2005-06	2006-07	2007-08	2005-06	2006-07	2007-08		
1.	HTM	58.9	108.35	103.04	58.9 (100.0)	108.35 (100.0)	35.67 (34.61)	Achieved	218 (2005-06) 364 (2006-07) 130 (2007-08)

Source: Department of Horticultre, Una

Table-5.8
Beneficiaries Benefited under Horticulture Technology Mission

S. No	Year	No. of beneficiaries
1.	2003-04	654
2.	2004-05	1116
3.	2005-06	1187
4.	2006-07	1184
5.	2007-08	467

Source: Department of Horticulture, Una

Looking at these trends it seems that achieving the targeted growth rate fixed by the National Horticulture Mission (NHM) or even by the state government for the 11th Plan period (2007-08 to 2011-12) for this sector will not be an easy task. What strategies should be followed to achieve the targeted growth rate of fruit production in the district? The options available are as follows:

- Increasing area under fruit cultivation
- Improving productivity of the existing orchards
- Improving post-harvest technology and infrastructure

No single option out of these can deliver the desired results. Thus all the options have to be availed. The scope of these options and the strategies for their adoption is discussed below.

Increasing area under fruit cultivation

On the face of it, increasing area under fruit cultivation seems to be the easiest option to achieve the target growth rate in fruit production. One would be tempted to recommend 6 % increase in area under fruit cultivation every year to ensure 6 % annual increase in the production of fruits. But in reality it is a most difficult task to execute. Keeping in view the past trends, it becomes all the more difficult. It will amount to an increase of over 300 hectare of land under new orchards every year. The main obstacles in the way of bringing more area under orchards are:

- Most farmers in Una district own small land holdings on which they practice subsistence type of farming. They are reluctant to shift their land from crop or vegetable cultivation to fruit cultivation.
- Most of the cultivated land in the district is rainfed. Fruit cultivation require assured irrigation, at least during the first 3-4 years.
- There is a gestation period of about 5 years before the economic return from fruit cultivation starts to accrue. The small and marginal farmers cannot wait for such a long time for economic returns, especially in a situation when they are totally or mainly dependent on land.
- Farmers are almost certain about the minimum returns from cultivating wheat, maize, paddy and other crops. There is no such certainty about the returns from fruit cultivation because, compared to crops, fruit trees are more susceptible to vagaries of climatic factors and other natural disasters.
- In case of certain fruit trees like mangoes, fruit bearing take place only on alternate years, thereby increasing the uncertainty of farmers.
- Unlike wheat, maize and rice, there is no minimum support price except in case of apple and certain other fruits. But that support price is not remunerative enough.
- The marketing of fruit is more cumbersome than that of grains, pulses, oilseeds etc.
- Saving of fruit crops from attacks by birds, squirrels and wild animals like monkeys is also very difficult.

Despite these obstacles some opportunities do exist for bringing more area under fruit orchards. These opportunities are as under:

- The district is covered under Horticulture Technology Mission. Various kinds of incentives are provided to the farmers for the cultivation of fruits under this mission. The district received an assistance of Rs 108.35 lac during 2006-07 and Rs 105.56 lac during 2007-08 for the development of horticulture under this mission.
- The district has over 6 thousand hectares of cultivable waste land and about 3.5 thousand hectares of fallow land other than current fallow. This land should be targeted for plantation of fruit trees. The reclamation cost of this land for fruit cultivation will also be less compared to reclamation cost for crop cultivation. Moreover farmers will be too willing to convert this waste land into orchard land.
- Most villages in Una district have common lands. Some part of these lands is being utilized for tree plantation under Social Forestry schemes as well as under NREGA programmes. Some part of these plantation areas can also be used for plantation of fruit trees.
- The channelisation of river Swan, which is in progress, is likely to reclaim a very large area in the river bed. Moreover a very large area along the river will become free from the menace of annual flooding. This tract along river Swan also holds good promise for fruit cultivation.
- Absentee land owners can be motivated to opt for fruit cultivation rather than crop cultivation.
- The progressive farmers are already adding some area to fruit cultivation every year.
- This shows that despite many hurdles the target of bringing about 300 hectares of area under fruit cultivation every year is achievable, provided concerted efforts are directed towards the potential areas suggested above. Since a large variety of fruits can be cultivated in the district. The department should promote the cultivation of as many fruits as possible. In fact possibility of cultivating even those fruits which are not yet cultivated in the district should also be explored. But since mango is the main fruit of this region. The district be developed into a Mango Estate, especially for desi mango. Special incentives may be provided for this purpose. To attract the farmers towards fruit cultivation the Horticulture Department have to provide the following to the farmers:
- Complete technical support and training about all aspect of fruit cultivation from pre-planting operations to post-harvest operations.
- Guidance in the selection of fruit and fruit varieties as per location of the land.
- Supply of quality planting material.
- Monitoring of all operations for the first three years after plantation of fruit trees.
- Financial assistance in the form of subsidy to meet the cost of land leveling, soil conservation, plantation materials, purchase of inputs, equipments, fencing, irrigation etc.
- Infrastructural and other facilities for the marketing of their produce.

- Certain gardening tools which are expensive should be made available to the farmers on rent.
- The Horticulture Department at the block level should prepare computer based directory of all the fruit growers of the area under their jurisdiction. This directory should have complete information about the farmers, his phone/mobile number, size of his orchard, detailed information about the fruit trees raised by the farmer. This directory should be updated regularly.
- Informing/reminding on phone/mobile each farmer about the various agronomic and horticultural operations to be performed by them from time to time throughout the year, should be made one of the compulsory and most important duties of the extension staff at the block level. Help of modern technology should be taken to send the pre-recorded messages to the farmers. In this arrangement expert advice is provided to the farmers without their asking. This arrangement is also cost effective because most operations are monitored from the office.

Improving productivity of the existing orchards

Production targets of fruit can also be achieved by enhancing the productivity of existing orchards. It is not uncommon to find many orchards having productivity much below the optimum level. The low productivity of these orchards can be due to number of factors, like poor health of the soil, non application of requisite quantity of manure, fertilizers and micro nutrients, improper control of weeds and pests, poor quality of planting material, improper spacing between plants, old and diseased plants requiring rejuvenation, etc. In short low productivity of any orchard is due to lack of proper knowledge of horticultural and agronomic practices on the part of farmers. Herein lies the critical role of the Horticulture Department. Fruit farmers need constant help and consultation from scientists and field staff, right from pre-plantation to the post harvesting stage. The extension staff of the Horticulture Department must visit every orchard, enlist the reasons for low productivity and provide guidance to enhance the productivity of orchards. Effort should be made to bridge the gap between Existing Horticultural Practices and the Recommended Horticultural Practices. Bridging of this gap will result in significant increase in the productivity of existing orchards. In many old orchards there are overaged and diseased plants. Replacement or rejuvenation of these plants can also increase the productivity of existing orchards. Adequate funds should be earmarked for this purpose in plan proposals.

Improving post-harvest technology and infrastructure

It is estimated that 25 to 35 percent of the horticulture produce is lost due to poor post harvesting technology and infrastructure. Post harvesting stage is most critical in the sequence of agricultural operations. Unfortunately, it is also the least cared for stage. From the plucking of the fruit to its final destination, in its journey, the fruit has to pass through

various operations such as carrying the fruit from the fruit plant to collection or packing site within the orchard, cleaning, grading, packing, transportation to market, transfer from market to the consumer through the vendor or to the food processing unit. Mishandling or carelessness at any stage can ruin the fruit partially or wholly. Farmers can enhance their income from fruit cultivation considerably if:

- Plucking of fruit is done at the right time since premature or late plucking result in losses.
- Plucking of fruit is done with utmost care to avoid any injury to the fruit. As far as possible farmers should opt for plucking of fruit by hand.
- Before taking the fruit to the market, it is cleaned, graded, and packed properly.
- Marketing being most crucial operation, the farmer learns the techniques of marketing his produce so as to maximize his profits.
- Fruit growers should form marketing cooperatives to market their produce and should also explore the possibility of processing the fruit.
- The HIMFED, KINFED and HPMC should provide incentives for the establishment of fruit processing units in the district.

The Horticulture Department can help the farmers in the post-harvesting operations by:

- Educating them about the proper time and technique of harvesting the fruits.
- Arranging the requisite supply of plastic crates and packing material at subsidized rates.
- Motivating all the fruit growers of the district to form cooperative societies, not only for marketing but also for plant raising and care.

(b) Vegetable Cultivation

Vegetables are grown an about 1.9 % of the total cropped area in Una district. In 2007-08 vegetables were cultivated on about 14 hundred hectares which included about 850 hectares under potato. The total production of vegetables was over 32 thousand metric tons.

About 78 percent of area under vegetables in the district is confined to Una tehsil, about 14 per cent to sub-tehsil Haroli and about 7 per cent to Amb tehsil. Bangana tehsil and Bharwain sub-tehsil accounted only for a fraction of the area.

Direct links have been observed between the quality of soil and cultivation of vegetables and fruits. The vegetables seek more fertile soils while fruits can be tolerant of less fertile soils. Fertility of soil is more critical for raising of potato. Cultivation of other vegetables is largely neutral to the soil factor. As the state, Una district also has the distinct advantage of climate in the production of vegetables, including potato and ginger, as their

productivity is higher than the national average in many cases. Additional inputs like modern technology, off season cultivation, cultivation in poly houses; research and other modern management inputs can make a noteable contribution to boost the production of vegetables. The district can earn additional income from the cultivation of vegetables like broccoli, off season vegetables and vegetable seeds. Other favourable factors for the cultivation of vegetables in the district are as follows:

- The cities of Chandigarh, Ludhiana, Jullundhur, Roopnagar and Baddi are emerging as big population concentrations and lucrative markets too for fruits and vegetables. The new housing projects, technical training institutes, industrial estates and other development activities are attracting a large migration to these cities. The process is going to gain momentum in future;
- The consumption pattern of the rural population also is gradually shifting to a regular intake of vegetables. This could be due partly to the urban influence and partly to the rise in income levels;
- The scientists of KVKs and department of Horticulture are educating the farmers through training camps to grow vegetables. The demonstrations at farmers fields or farm trials are undertaken by introducing new hybrid varieties with complete package of practices on crop production, crop management and crop protection;
- Fairly good returns from potato cultivation in the district may attract more area under potato crop. The damage caused to potato crop due to severe cold and late blight and potato tuber moth may prove a temporary setback. The impact of such eventually needs to be managed by promoting disease resistant varieties.

Vegetables are mostly grown around Una – Santoshgarh belt in the district. Besides, the local farmers the migrant Muslim families from Uttar Pradesh are also growing melons, cucumbers, ghia, pumpkin, capsicum, tomato and snake gourd on the banks of Swan river. These crops are grown successfully in poor soils, comprising of barren sand. They sow the vegetables with the onset of winter in trenches which are filled with a mixture of soil and farm yard manure. The size of the trenches is 80-100 metres long and 0.7 to 1.0 meter wide. The distance between two trenches is about 5-6 metres. The vegetables seeds are sown on the one side of trench and the other side is dug out to the level of nitrogenous fertilizers and compost placed. The roots of the crop tend to move towards the moisturous nitrogen compost zone which is lower than sown area of the trench. The crops do not face any moisture stress with the water table being shallow in the river bed. The young plants are protected against frost and wind by erecting hedge of tall grass between the rows of crops. The quality of vegetables is high with least occurrence of disease, as the barren sand over surface and relatively dry plants warrant less infestation from the soil and air borne diseases.

Compared to migrant vegetable growers, the productivity of local vegetable growers is

much less. The main reasons for that area are as follows:

- Use of low quality seeds
- Lack of proper knowledge about vegetable cultivation
- Low use of inputs like manure, fertilizers etc.
- Poor management of pests and diseases
- Poor irrigation facility

Extension of area under vegetables cultivation

The following efforts should be made to increase area under vegetables cultivation:

- The required funds for shade nets and plastic tunneling should be increased for the district so that more farmers could benefit from the scheme. However the farmers have to be educated about the benefits of these technologies;
- Additional funds to be made available for drip/sprinkler irrigation system and field water storage tanks;
- The demonstration of Integrated Nutrition Garden, for domestic requirements should also be started. Efforts should be made to cover as many villages as possible under this scheme. The KVK needs to be strengthened and upgraded for development of agricultural sector, including vegetables cultivation; and
- Vegetables processing units, preferably at Una can further promote vegetable cultivation in the district.

Enhancing the productivity of the existing area

The area which is already under vegetables may be transferred to fruit cultivation or cultivation of wheat-paddy, wheat-maize or some other crop combinations, if the productivity of vegetables is not increased. Following steps may be taken to avert such a situation:

- Green houses, net houses and plastic tunneling have been found very useful for producing summer off season vegetables for an early arrival in the market, ensuring a lucrative return to the farmers. This technology must be popularized among the vegetable growers, especially small land holders. NHM provides subsidy on these technologies. Farmers should be motivated to take benefits of these incentives;
- Exotic vegetables, such as yellow and red varieties of capsicum and broccoli be given preference through green house cultivation. These command very high price in the market;
- New techniques of growing tomato, bitter gourd (karela), kheera and lauki are adopted. Under these techniques, the fruits of these plants do not touch the ground. Such vegetables command better prices and fruit loss in the field is much less;
- There is a need to motivate the farmers to adopt organic vegetables cultivation;
- Farmers be advised to use only high quality seeds of vegetables. As the seeds, especially of those produced by the MNCs are very expensive, 50 per cent subsidy

be given to the farmers for the purchase of university approved seeds; and

- Soil testing for micronutrients level should be done regularly.

Improving Post-Harvesting Technology

It is a common knowledge that a substantial percentage of vegetables produce is lost because of poor post-harvesting practices and careless handling while doing packing, loading, unloading and transportation. A significant proportion of the produce get damaged or decayed on reaching the market. The shelf life of the vegetables also gets reduced, particularly when, apart from potato, no other vegetable is taken to the cold storage.

To improve post-harvesting practices and technology, the following steps should be taken:

- The farmers should be trained in the proper harvesting, grading, packing and handling of vegetables at various stages by organizing workshops and through demonstrations.
- Packed fresh frozen vegetables require freezing of the vegetables soon after harvesting. For this, there is a need to develop low cost freezing technology at the farm level itself. Funds be earmarked for research and development of this technology.
- Farmers should also explore the possibility of marketing their produce at distant markets. Una has good rail and road connectivity with Chandigarh, Delhi and many other towns of Punjab & Haryana. Vegetables growers can utilize these connections to their benefits.

BHABHA Atomic Research Centre, Mumbai has developed a new technology to increase the shelf life of the fruits, vegetables and other items, by processing these through atomic radiations. It is claimed that radiation processed potato can be stored at 15° C temperature, where as the normal potato is stored at 3° C. It is, therefore, recommended that atomic radiation processing facility be explored.

(c) Mushrooms Cultivation

Mushrooms are popular for their delicacy, flavour as well as food value. There is an ample scope for the cultivation of mushrooms both for domestic consumption as well as for export purposes. Mainly two types of mushrooms viz. white button mushroom and Dhingri are being cultivated in Himachal. FAO/UNDP Project Chambaghat (Solan) and Indo-Dutch Project, Palampur (Kangra) are two externally aided projects which are facilitating commercial cultivation of mushrooms by using modern technology. The pasteurized compost (1350 MTs) from these units is being made available to registered mushrooms growers of Shimla, Solan, Sirmour, Kangra, Chamba, Hamirpur, Una and Bilaspur districts. With the completion of those units, production capacity of pasteurized compost will be 3150 MT per annum.

Training facilities for the mushrooms cultivation are available at KVK Una. Small and marginal farmers as well as unemployed youth can be motivated to adopt mushrooms cultivation. Although the process is not without some constraints but mushrooms cultivation may not pose any problem during winter. However, for the summer cultivation, the air conditioning is necessary. This may require heavy investment and will increase the cost of production making it uneconomical. The farmers will not be able to face the competition from mushrooms grown in upper (cold) areas of the state during summer. So, the best option would be to cultivate mushrooms only in winter. Cultivation of mushrooms has not been covered under NHM. Being a highly perishable product its marketing is also cumbersome. As such, the state government may provide some subsidy on mushrooms cultivation to unemployed youth, marginal farmers and women.

(d) Floriculture

The commercial floriculture is one of the main thrust areas of 11th Plan in the state. The existing potential in the state can be explored for the cultivation of wide range of flowers, ornamental plants and production of flowers seeds/bulbs for year round supplies to the domestic as well as export market. An area of 250 hects was proposed under floriculture during the 10th Plan Period.

The area under floriculture in Una district is very limited (i.e. 30 hects). There is a much scope, increasing area under floriculture. Now under the National Horticulture Mission, 50 per cent subsidy is provided to the small and marginal farmers and 33 per cent to the other farmers for the cultivation of cut flowers, bulbous flowers and loose flowers, more farmers are likely to take up floriculture in the district. With some efforts, an area of about 100 hectares can be brought under floriculture. While selecting the beneficiaries for this purpose, preference should be given to farmers who are: (i) educated and progressive, (ii) located along or near the main roads, (iii) having their own transport or some other vehicle for transportation of flowers. To achieve the stated target, the department of horticulture should do the following:

- Educate the farmers about the scope of floriculture and the incentives available under the national/state Horticulture Missions;
- Select the beneficiaries carefully, preferably those who fulfill the conditions mentioned above; and
- Provide proper training to them in the cultivation and post harvesting operations, including marketing and preparation of seed.

(e) Cultivation of Spices, Aromatic and Medicinal Plants/Crops

The peculiar topography and agro-climatic conditions in most parts of Himachal Pradesh limit the scope for production of field crops, but the same offers suitable conditions for cultivating horticulture crops. Further, the food grains cultivation, except in some areas of

the low hill zone, does not offer good potential to sustain economic well being of the hill people. Therefore the best use of the land can only be made through cultivation of perennial fruit crops. Besides, fruit crops, there is also a big scope for the cultivation of medicinal and aromatic crops as the state's land is the most suitable for their cultivation.
Due to continous increase in the demand for herbal medicines around the world and with little control over their collection or trade regulation, the only way to protect wild population of medicinal plants and minimize threats to sustainability is to increase the supply of equally effective cultivated specimens. Shift from collection to cultivation of medicinal and aromatic plants, will also ensure purity, authenticity and sustainable supply of raw materials, required for herbal drugs including poly herbals.

The efforts to promote cultivation of medicinal and aromatic plants are still in their early stages and some of the basic reliable information on some of the underlying economic variables associated with their cultivation is not easily available. The Ministry of Agriculture has assigned six Agro Economic Research Centres (AERCs) located in the states of Karnataka, Kerala, Madhya Pradesh, Maharashtra, Uttaranchal and West Bengal for promoting the cultivation of medicinal and aromatic plants in these states. Himachal Pradesh should also have one AERC, as the state has a big treasury of herbal and aromatic plants.

Despite the multifarious advantages associated with cultivation of medicinal and aromatic plants, their adoption for cultivation by farmers, however, is not encouraging. This is due to the fact that medicinal and aromatic plants sub sector in India operates in a policy vacuum. Encouraging cultivation of these crops requires concurrent policies and effective actions aimed at regulating collection of medicinal plants from wild; research, development and extension efforts aimed at developing newer plant varieties suitable for utilization and their propagation and adoption by farmers. Further more, there is a need to organize effective post harvesting measures and trade operations which include the processing, marketing, developing an efficient marketing infrastructure and efficient information base focusing on market intelligence and its timely dissemination.

- Systematic cultivation of medicinal and aromatic plants needs specie-specific and location specific cultural practices, depending on prevailing soil, water and climatic conditions at given location. Hence research and development work and cultivation techniques have to be tailored. Keeping these in view, thorough efforts need to be made towards standardization of cultivation practices and harvesting times to get the desired quality of medicinal and aromatic plants.
- While developing cultivated varieties, efforts need to be made towards genetic enhancement of at least some of these species, as compared to that of species found in the wild by using different methods of breeding including thorough traditional genetic transformation and use of bio-technology.

- Nurseries need to be developed to make planting material easily available to the farmers.
- Widespread field demonstrations of species developed for cultivation will motivate the farmers to adopt cultivation of medicinal and aromatic plants.
- Farmers would switch over to cultivation of the medicinal and aromatic plants, besides other factors, if returns from these are substantially better than the alternative crops, being cultivated by the farmers. The package of practices for such plants should be to ensure minimization of the cost of cultivation and maximization of the plants yields. Currently, the cost of planting material is the major cost in cultivation of these plants. Efforts need to be made to cut down on the cost of planting material to improve the relative crop economics.
- Efforts should be directed towards development of the species suitable for cultivation under organic farming conditions.
- There is a need for setting up a network of regional analytical labs to facilitate the analysis of the constituents of the medicinal plants so that quality certification could be done. Some labs could be authorized to issue certification as a means of building buyers confidence as also for product standardization.
- If appropriate cultivation practices are developed and the crop economics is favourable, efforts can also be made to popularize cultivation of medicinal and aromatic plants in green houses as well as inter- crops.
- Even simple interventions, such as better method of harvesting, storage, grading and local level value addition can substantially improve returns to local people. There is a need for capacity building of farmers and extension workers in realizing these benefits, so that returns from cultivation can be improved.
- Himachal Pradesh has a good network of institutions i.e. agricultural and forest universities and research centres undertaking research on various aspects of cultivation of medicinal and aromatic plants. However, there does not appear to be much co-ordination amongst them. As a result there are some overlaps and duplication of efforts. Therefore, apart from better co-ordination amongst them, there is a need for an added interaction and co-ordination between the research institutions/universities/concerned departments so that marketing feed back could be obtained and research efforts could be prioritized accordingly.
- The current agricultural statistics in the state is confined only to the major field crops, horticulture crops and vegetables. Similar data base pertaining to area and production of medicinal and aromatic plants need to be developed. In addition, there is also need for creating a data base on such variables as specie wise demand, supply and uses etc.
- Lack of availability and access of market information is thus an important factor constraiting improvement of returns to producers of medicinal and aromatic plants. Apart from creating the data base on extent of cultivation of these plants, there is a

need to set up a market intelligence unit to collect, analyze and widely disseminate latest and reliable information relating to markets, marketing channels, prices, trade including imports and exports and make this information available to all concerned in a timely method.

- The processing of medicinal and aromatic plants is generally done through either one or two stages. The first stage is semi-processing while the second stage is conversion in to formulations. While conversion into formulations requires appropriate infrastructure facilities and technical know how and may be beyond the reach of an ordinary farmer, however, semi-processing involving such functions as cleaning and grading and undertaking such activities as drying, powdering, making concentrates, boiling and distilling, etc can be done at the local level. Marketing of semi-processed product rather than raw crop can lead to value addition and improve the profitability of the cultivators. Efforts thus need to be made to encourage semi-processing of these crops by encouraging setting up of diversified small scale enterprises/cottage industries in remote and far flung areas either through formation of co-operatives or through encouragement of small private entrepreneurs. This will also help in reducing the transportation and packing costs of raw materials and also provide additional employment to local people.
- Efforts need to be made to encourage entrepreneurs to set up more processing facilities for preparation of formulations.
- Till now, the institutional efforts are confined up to cultivation and propagation, but are almost totally absent for development of marketing. The trade is currently non-transparent, inefficient, imperfect, informal and opportunistic and often carried out in hush-hush manner. As a result, the farmers are able to realize only a very small friction of the price paid by the crop profitability and not providing enough incentives to the farmers to go in for its cultivation. Policy intervention aimed at promoting cultivation of medicinal and aromatic plants has thus considered marketing as a major component.
- The important constraints for marketing of medicinal and aromatic plants in Himachal Pradesh arise as a consequence of factors like the hilly terrain with sparse habitation, thinly spread, inadequate infrastructure development (principally road and transport). In relation to these characteristics, generally small size of farm holdings of which only a small portion may be devoted for cultivation of these plants, and low levels of production that too realized over three to four cuttings in a year. In the absence of any institutional support, the farmers have no option but to fall in the trap of agents of dealers and sell their produce at whatever price is being offered to them. These un-organised market channels lead to monopoly of few individuals and industries controlling and dictating the market and depriving the farmers of a more remunerative price for their produce. To promote large scale cultivation of these crops, the state should have to intervene either through

formation of farmers marketing co-operatives or promoting contract farming under a legally binding enforceable contracts, monitored by a regulatory authority.

- The post harvest marketing operations e.g. harvesting, grading and standardization system of certification, packing and transportation need to be improved to meet the domestic as well as international quality standards and post harvest marketing operations. It may also be necessary to have ISO systems of certification for international regulations.

The National Horticulture Mission has a scheme to promote the cultivation of spices and aromatic plants. There is a provision in this scheme for 75 per cent subsidy on the cost of cultivation of chilli, turmeric, garlic, mentha and karnauli. The maximum limit is Rs. 11250/- per hectare up to 4 hectares per beneficiary. There is ample scope for the promotion of cultivation of ginger, turmeric, karnauli and other spices, in the district. Turmeric and ginger can be successfully cultivated as part of agro-forestry, especially with poplar plantation. Cultivation of Ashwagandha and some other medicinal plants should also be explored in the district.

The main constraint in promotion of these crops is the lack of awareness among the farmers about the market demand, profitability, sources of improved seed, and proper cultivation and harvesting techniques.

Strategies and Action Plan

Keeping in view that turmeric, ginger and onion are already cultivated in the district; therefore increasing about 50 hectares of area annually under each of these crops should not be a problem. Turmeric crop can be successfully cultivated as an independent crop as well as an inter- crop with poplar, eucalyptus and other agro-forestry trees in the district. Cultivation of Karnauli (ajwain) and other medicinal and aromatic plants is possible but not much can be said about their economic returns at this stage.

The following action plan may be adopted to promote the cultivation of spices, aromatic and medicinal plants in the district:

- KVK Una be asked to conduct studies for identification of the most suitable varieties of these crops, along with research on appropriate cultivation techniques and economics of cultivation of these crops;
- Special funds be provided to KVK Una to take up front line demonstration plots of one kanal each in a number of villages for the cultivation of all types of spices, aromatic and medicinal plants for domestic use;
- Village level camps be held in different parts of the district to create awareness about the demand, profitability, sources of certified seed, cultivation practices, and incentives provided under NHM/HTM;
- In the beginning, emphasis should be given on the cultivation of only chillies,

garlic, ginger and turmeric;

- Farmers who are already raising onions, ginger or turmeric be identified, and through personal contact they may be motivated to increase area under these crops;
- In the next phase, some progressive farmers, preferably from the same villages, should be motivated to cultivate these crops;
- Farmers who are doing agro forestry be convinced to grow turmeric in place of other crops in their plantations;
- Neem plantation be promoted as a part of agro forestry, as its leaves, fruits, bark and sap has medicinal values; and
- Village panchayats may be induced to grow turmeric on common lands. This will also increase the income of panchayats.

Conclusion

From the discussion above, the following conclusion can be drawn:

- Fruits are cultivated on an area equivalent to about 13.5 % of the net sown area and vegetables account for about 1.9 per cent of the total cropped area in the district. The former accounts for about 7 percent and the latter about 3 percent of the total cropped area. Flowers, spices and aromatic plants are grown over a very small area;
- Vegetables are mainly concentrated, around Una (Una-Santoshgarh belt) and fruits cultivation is expanding to the other parts of the district also;
- While more fertile soils are reserved for vegetables cultivation, orchards generally get below average soils;
- Among fruits, mango accounts for almost 33% of the total area under fruits. Kinnow and pear are also grown on fairly large area i.e. 16 % and 15 % respectively and lemon on 12 % area. Among vegetables, potato accounts for about 1.2 % and other vegetables about 0.8 % of the total cropped area of the district;
- Most of the funds received under horticulture development schemes are used for the development of fruits cultivation. Promotion of vegetables cultivation receives less funds;
- Cultivation of flowers, spices and aromatic plants has good scope in the district;
- There is a need to introduce better varieties of kinnow, mango and litchi;
- The area around Una & Amb be developed as potato seed producing area;
- There is need a to adopt new technologies like green houses, shade nets, plastic tunnels etc. for the cultivation of vegetables;
- Development of post harvesting technologies and marketing are very crucial for the development of horticulture. Farmers need to be educated about these technologies and marketing strategies; and
- Setting up of fruits and vegetables processing units within the district is a must for the promotion of this sub-sector.

5.3 Sericulture Development

Sericulture is one of the important agro based industries of Himachal Pradesh that provides gainful employment to about 8400 rural families for supplementing their income by rearing silk-worms and selling cocoons produced by them. During 2007-08 approximately 1.05 lakh kg green cocoons were produced which provided an income of about Rs 82 lakhs to the sericulture rearers.

Sericulture is not practiced at a large scale in Una district. Potential for its development needs exploration. Here in the district, the major activities like extension and training, silk seed production, distribution of mulberry saplings and facilitation in marketing of silk cocoons are undertaken by the sericulture department. A sericulture unit has been established at village Takarla (block Amb). The farmers are facing the following major problems with regard to sericulture development;

- Non availability of high yielding varieties of mulberry plants; and
- Lack of technical know how about marketing system and high yielding varieties.

It is a fact that sericulture provides livelihood opportunities for women, disadvantage sections of society, small and marginal farmers and landless households in the district, the following interventions can be suggested for development of sericulture in the district; (i) New host plantation; (ii) Maintenance of food plants; (iii) Mulberry plantation; (iv) Assistance to private mulberry grainers; (v) Assistance to strengthen mulberry multiplication infrastructure; (vi) Support to mulberry seed/commercial rears for plantation; (vii) Assistance for construction of cocoon strong house; and (viii) Cocoon drying yards.

The broad strategies required for sericulture development in the district would be: (i) Increase in area under sericulture feed plantation; (ii) Increase in the capacity of seed farms; (iii) Improvement in credit and market linkages for co-operatives/marketing through organized groups; (iv) Promotion of high yielding varieties of mulberry; (v) Effective tie up of farmers co-operatives with weaver's co-operative; (vi) Popularization of scientific technologies; and (vii) Ensure SHGs availability of equipments.

5.4 Animal Husbandry

Animal Husbandry & Dairy Development

Una district has 2, 15,052 livestock which account for 4.3 percent of total livestock in the state. The share of cattle, buffaloes, goats, sheep and poultry in Una district is 1.0, 2.4, 0.4, 0.03 and 9.2 percent respectively of the total livestock in the state. The main animal wealth being reared by the farmers in the district is cattle, buffaloes, goats & poultry while other domestic species like sheep, horses, ponies, donkeys and camels are also reared by a small section of society for earning their livelihood.

The district has 57443 cattle which account for 28 percent of the total livestock population in the district, the number of buffaloes is 124545 which is 61 per cent of the total livestock population. District Una has 16 per cent of the total buffaloes in the state. The number of goats in the district is also fairly large. The detail of livestock population is provided below in table-5.9.

Table-5.9
Animal population according to Livestock census

Cattle	51834	**Buffalo**	122834	**Total Livestock Population**
Goats	19460	**Sheep**	1660	215052
Horses	167	**Ponies**	19	
Donkey	75	**Camel**	12	
Dogs	18991	**Poultry**	70077	

Source: Livestock census 2003

Table-5.10
Tehsilwise Livestock & Poultry in Una district

S. No.	Tehsil	Cattle	Buffaloes	Sheep	Goat	Others	Total	Poultry
1	Amb	25208	38479	17	4827	206	68737	6195
2	Una	13165	40798	9	4789	274	59035	69308
3	Bangana	10174	26163	103	7276	138	43854	2813
4	Haroli sub-tehsil	5726	15777	-	4131	97	25731	18341
5	Bharwain sub-tehsil	3170	3328	30	607	50	7185	105
	District Total	57443	124545	159	21630	765	204542	96762
	District's share in State	2.61	16.11	-	1.94	-	4.04	12.67

Source: Statistical Abstract of Una district

Table-5.10 shows the tehsil/sub-tehsil wise distribution of livestock. The table shows that Amb tehsil accounts for about 44 % of the total cattle population of the district. Buffaloes are mainly located in Una, Amb and Bangana tehsils. These units account for 32.8 %, 30.9 % and 12.7 % of the total buffaloes in the district. One third of the total goats are located in Bangana tehsil. Their numbers are also fairly large (between 4-5 thousand) in Amb and Una and Haroli tehsils. Their numbers in Bharwain sub-tehsil however are very low.

No doubt, the number of cross breed cows is continously increasing in the district but till now, the buffaloes are more in numbers. The reason behind the preference to buffalo is the liking for buffalo milk. The average milk productivity of both local as well as locally managed upgraded animals is very low. The main reasons are; (i) lack of knowledge about better management practices (ii) poor feeding of animals; and (iii) no regular de- worming of animals.

The important point needs to be highlighted here is that the provision of extension services for raising and caring of livestock has emerged as a crucial task in the district. This calls for arranging training courses for proper management of livestock, at the grassroots level. Since it is generally the women who look after the livestock, the training courses should target women and the necessary training exercises can be conducted through the Panchayati Raj Institutions (PRIs).

As such, the upgradation of livestock requires better coordination between the department of animal husbandry and several other concerned departments i.e. forest department for management of pastures, agriculture department for raising fodder, industry department for processing the livestock produce of all varieties and department of rural development for organizing training courses to achieve the goal. Above all, the activities linked with the department of bio-technology and veterinary science education institutions, too need to be improved.

The contribution of the department of Animal Husbandry is most crucial in the development of agriculture and allied sectors. The animals whether they are milch, draught, meat and wool providing animals or poultry birds, form almost inseparable part of the agriculture. Their development and health care is the responsibility of Animal Husbandry Department. The main functions of the department are:

- providing health services to all categories of animals;
- carrying out vaccination of animals against communicable diseases;
- improving the genetic characteristics of animals through cross breeding and introduction of exotic breeds;
- carrying out artificial insemination of cows and buffaloes using high quality semen; and
- holding awareness camp regarding animal's health and fertility.

Enriching Animal wealth

The animals in the district are suffering from the following problems:

- **Low productivity:** The productivity of indigenous breeds of cows is much below the productivity of Jersy and H. F. cows. The productivity of even cross bred cows is less than the pure breeds of Jersy and H. F. cows. There is a need for further improvements in the cross breed cows. Data indicate that the district has less number of cross breed cows. As a result the dairy farming with cows is still unpopular. Although the best breeds of buffaloes are found in India and Pakistan, yet most buffaloes in Una district are of non-descript breed with low productivity. Similarly, the indigenous varieties of goats and sheep are low yielding in production of meat and wool.
- There is no **reliable database** on the performance and pedigree of dairy animals.
- **Animal diseases:** It has been reported that important veterinary diseases are prevalent in the district which cause direct economic loss to the farmers. Disease diagnostic facilities particularly of goats, sheep etc are also inadequate.
- **Nutritional Deficiency:** It is observed that the animals suffer from low input/output syndrome. The nutritional needs of the animals are met mainly through the feed. Unfortunately the feed given to the animals is not only lesser in quantity and but also poor in quality. Against the recommended quantity of 50 Kg

of green fodder, the animals are given even less than half of this quantity. The nutritional deficiency is the main cause of low output of milk and meat per animal, as well as, low fertility in milch animals especially among cows. The available compounded cattle feed needs improvement.

- **Lack of Training facilities:** All training and awareness programmes of Animal Husbandry Department are mainly focused on cows and buffaloes. The facilities for training and awareness programmes in relation to other animals are lacking.
- **Quality of milk needs improvement** by way of careing at the source while milching
- **Deficiency of Fodder Seed:** Farmers generally complaint that certified seed of fodder is always in short supply and the distribution is also faulty.
- **Unremunerative milk prices** and vast fluctuations therein.
- **Financial Constraints:** Credit from the banks and other financial institutions to the livestock sector are mainly provided for milch animals. Sheep, goat and other animals are given least priority. In addition, the cost of institutional finance is very high and the procedure is also cumbersome.
- Low **milk processing facilities**
- Lack of facilities for **mobility, communication and e-connectivity.**
- **Income Tax exemption, interest rate and power tariff needs** to be brought at par with agriculture.

Poultry Farmers have their own specific problems such as

- They have to depend on private veterinary services;
- Lack of quality feed; and
- The prices of poultry products are highly fluctuating

Strategy

In order to address the constraints pertaining to Una district and to achieve the envisaged growth, the strategy should be focused on expansion and improvement of dairy farming activity. This calls for intensive training, education and extension services besides incentives and infrastructural facilities. Some of the activities, which cannot be restricted to the district level, are common to the state, although these are essential to achieve the district wise targets.

Plan of action

- Genetic improvement of animal stock; especially the milch cattle, should get the top priority of the department. Preservation of certain good quality local breeds of animals also needs attention. To increase the population of pure breeds of Jersy and H.F. cows and bulls, cattle breeding farms of the department may undertake embryo transplantation programme. Embryos of pure Jersy and H.F. breeds may be

imported for transplantation in surrogate mothers here. It will cost much less than importing the animals. The cross-breeding programmes of the department should also be promoted. Adequate funds for research be provided for this purpose;

- The indigenous breeds of Murrah and Nilibar breeds of buffaloes need preservation. For that a special animal farm be set up in the district;
- The artificial insemination facility requires improvement. The persons carrying out this service need proper training. Adequate funds should also be provided for liquid nitrogen;
- To impress about the benefits of deworming and eradication of external parasites, all the milch cattle in the district be provided this service at least once a year free of cost;
- Vaccination of animals against communicable diseases be done regularly and veterinary health services be improved in the district. It is reported that many veterinary hospitals and dispensaries are lacking in basic facilities. The vacant posts of veterinary doctors and pharmacists should be filled at the earliest;
- Private veterinary clinics and consultants for reproduction, insemination training, disease control programmes be encouraged;
- To improve the nutritional deficiency of animals, availability of green fodder be increased. Arrangement for certified seed of fodder should be made. Cultivation of barseem, maize, oats, sorghum, napier and other grasses be encouraged to increase the availability of green fodder. Area under fodder crops should also be increased and the pastures should be cleared from the lantana and other weeds. In addition, the quality of animal feed should also be ensured;
- Skin and leather processing units be encouraged in the district; and
- Marketing of poultry products be improved. Processing of poultry products can further add value to poultry products.

Dairy Development Plan

The targeted growth in milk production by the end of next five year plan is possible, provided all the service providers and stakeholders make concerted efforts as it will involve increase in productivity of the existing milch animals, optimum exploitation of the available genetic potential and induction of new milch animals. To increase the productivity the major contribution is of the genetic up gradation of milch animals for which Animal Husbandry Department has a major role to play. The department can assume the responsibility of induction of additional milch animals and transforming the backyard dairy units into commercial dairy farms with minimum five to ten animals and arranging their training for better herd and milk management through latest techniques and farm practices, genetic up gradation, veterinary disease control and balanced nutrition. There is a dire need to boost the inputs, add fresh inputs and offer incentives to induce the

existing dairies and prospective dairy farmers to take up milk production on commercial lines.

Table-5.11
Status of Animal Husbandry Institution, Production of Milk and Eggs in Una

Year	Hospitals	Dispensaries	Milk (Ltrs)	Eggs
2004-05	18	98	71,090	5,27,000
2005-06	18	106	89,661	2,59,800
2006-07	18	110	1,03,563	54,74,443
2007-08	18	111	66,196	1,30,83,490

Source: Department of Animal Husbandry

In order to cater management needs, health cover of livestock and control of diseases that inflict livestock directly or indirectly, the department of Animal Husbandry is operating through a network of 129 Veterinary Institutions that include 18 Veterinary Hospitals, 1 Central Veterinary Dispensary, 1 Mobile Veterinary Dispensary, 4 Veterinary Check Posts, 104 Veterinary Dispensaries and 1 Government Poultry Farm. The location of these institutions is scattered through out the district for providing prompt services to the livestock and livestock breeders. The manpower in these institutions is in the form of 2 Senior Veterinary Officers, 19 Veterinary Officers, 2 Chief Veterinary Pharmacists, 16 Animal Husbandry Assistants and 130 Veterinary Pharmacists, to provide best services for the betterment of livestock in Una District.

There is a wider scope in the improvement of veterinary services to uplift the economic status of poor farmers and improve the nutritional requirements of both rural and urban people in the district.

Measures to be taken for the improvement of Veterinary Services

- up gradation of technical know how of the field level functionaries and farmers for better; dissemination and proper rearing of livestock;
- Familiarizing farmers with the modern technique in animal husbandry practices;
- increasing the fodder production in terms of both quantity and quality;
- enhancing the breeding efficiency of milch animals for better production and reduce intercalving period;
- decreasing the calf mortality through better management and health cover;
- improving the health and nutritional status of milch animals;
- reducing the number of unproductive animals;
- dealing with the menace of stray cattle;
- providing specialized services in the treatment of livestock ailments; and
- improving the quantity and quality of wool and meat in sheep and goats;

Activities to be taken up

The proposed plan

To achieve the target growth rate in dairy sector during the next five years, there is a need to; (i) increase in productivity of the existing milch animals; (ii) optimum exploitation of

the available genetic potential; and iii) induction of new milch animals. The major contribution is of the genetic upgradation for which the department of Animal Husbandry has a major role to play. At present, the urgent need is to induct additional milch animals and transform the backyard dairy units into the commercial dairy farms with minimum ten animals and arranging their training for better herd and milk management through latest techniques and farm practices. The following plan of action is proposed to achieve the above stated objectives:

1. Setting up Commercial Dairy Farming Units

It is proposed to establish 200 commercial Dairy farms in the district with herd size of 10 or more milch animals. The plan is to induct 2750 additional milch animals in the district in five years to increase the milk production. The following incentives are proposed to attract the people to take up Commercial Dairy Farming:

- Cost of Chip to be implemented in the animal for identification @ Rs 250 per animal.
- Cost of insurance @ 2% of the cost of animals (Rs 30,000)
- Interest subsidy on the total project cost for the first five years.

The total incentives come to Rs 5350 per animal. For this purpose Rs 147 lakh are needed.

2. Strengthening infrastructure for quality and clean milk production

To maintain the quality of milk two suggestions are; (i) strengthening milk producers and milk handlers to maintain proper sanitation and hygiene; and (ii) creating facility of cooling the milk at source immediately after milking. For that it will need the provision of Bulk Milk Coolers to the Milk Cooperatives at subsidized rates. Government of India has already launched the scheme to provide financial assistance to Milk Cooperatives to the tune of 75% of the capital cost of Bulk Milk Coolers

3. Incentive for the establishment of mini milk processing unit at the dairy farm level

There is a need that the farmers should be educated through Dairy Entrepreneurship Training about the scope of converting milk into milk products at the farm level. A mini milk plant of 500 liter capacity can be set up at the dairy farm level at an estimated cost of Rs 20 lakh. Such a unit can produce 7-8 products, including paneer, butter, lassi, sweetened flavoured milk, whey drink, ghee, curd etc. these products can leave handsome margin to the producers. Financial assistance 50 per cent of the capital cost is recommended. It is proposed that 3 mini milk processing units be set up in the district for which Rs 100 lakh are needed.

4. Quality control on feed and milk through consumer awareness

To exert quality control on compounded cattle feed, and to assure the quality of milk to the consumers, a proposal for having a mobile compounded cattle feed analytical laboratory

with the facility to analyze milk samples has been made. This twin purpose mobile laboratory will be stationed at the district headquarter and will ply on pre-determined route to render the services to the consumer in the entire district at their door step. The analysis of compounded cattle feed purchased by the farmers and milk sample of the consumers will create awareness about the quality of feed and milk among the consumers of these products. It is felt that consumer awareness is the most effective deterrent against any kind of adulteration and an effective check on the quality. The tentative cost of such a mobile laboratory is Rs 50 lakh.

In addition to the above proposals, the department of animal husbandary district Una has prepared a detailed perspective four year plan for the development of liverstock sector in the district. On the basis of this plan, the following five year perspective plan is developed to be proposed under C-DAP, Una

(i) Extension and Training

Livestock are still being reared under some preventive type of Animal Husbandry manage ment practices. The field experiences show that the latest technical know how is required to be percolated to the farmers for rearing livestock and poultry with improved system which is the need of hour. The education and training of farmers vis-à-vis the technical personnel of the department is also required so that the existing gap between the present operational practices and the one required in the present scientific era is minimized and the farmers are acquainted with the improved techniques for adoption. The training of technical personnel of the department will also fill up the gap that exists between lab and land.

S. No.	Particular	Ist Year		IInd Year		IIIrd Year		IVth Year		Vth Year		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1	Field Level Workshops, 2 in eachcluster/year, @ Rs. 1000/ workshop	94	0.94	94	0.94	94	0.94	94	0.94	94	0.94	470	4.70
2.	Institutional Training to 15 pesons in each cluster @ Rs. 1500/ cluster	705	7.05	705	7.05	705	7.05	705	7.05	705	7.05	3525	35.25
3.	Literature on various managemental practice, 500 pamphelts in each cluster, @ Rs. 10,000/ Cluster	23500	4.70	23500	4.70	23500	4.70	23500	4.70	23500	4.70	117500	23.5
4.	Domonstration for Fodder enrichment and Alkali treatment of Paddy straw, 2 in each cluster/Yr @ Rs. 1000/camp	94	0.94	94	0.94	94	0.94	94	0.94	94	0.94	470	4.70
5.	Cluster Level meeting, 4 in each cluster/Yr. @ Rs. 2500/meeting	188	4.70	188	4.70	188	4.70	188	4.70	188	4.70	940	23.50
6.	Breeders Conference at Distt. Level	1	1.00	1	1.00	1	1.00	1	1.00		1.0	5	5.00
Total			**19.33**		**19.33**		**19.33**		**19.33**		**19.33**		**96.65**

(ii) Improvement in Fodder Production

The district is deficient in fodder as well as forage. During the lean season, the farmers have to purchase fodder from the adjoining states and have to suffer with huge financial burden.

The establishment of fodder banks can minimize the farmers overspending and the wheat straw from such banks may be easily and cheaply available round the year. Most parts of the district are still underdeveloped and infertile. The grass land development through application of fertilizers, weeding and seeding may augment the availability of fodder and provide space for maximum physical exercise which livestock may get through grazing. No livestock may be economical and fruitful in production unless they are provided with better nutrition and green fodder.

The livestock health depends on the availability of balanced nutrition/ feed/fodder. This can be achieved by encouraging people, in growing latest varieties of fodders through the distribution of tested and well developed varieties of fodder seed and also making available the plants and fodder grass roots that can supplement the fodder availability in all weathers.

S. No	Particulars	Ist Year		IInd Year		IIIrd Year		IVth Year		Vth Year		Total	
B	Improvement in Fodder production	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**
1	Fodder demonstration plots, 5 in each cluster @ Rs. 1000/plot	235	2.35	235	2.35	235	2.35	235	2.35	235	2.35	1175	12.78
2	Fodder seed incentive to the breeder, 10 Qtl/cluster/year @Rs. 1000/q.	470 Qtl.	4.70	470 Qtl.	4.70	470 Qtl.	4.70	470 Qtl.	4.70	470 qtl	4.70	2350	23.50
3	Improvement of wasteland, 5 plots/cluster/year @Rs. 1000/plot	235	2.35	235	2.35	235	2.35	235	2.35	235	2.35	1175	11.75
Total			**9.40**		**9.40**		**9.40**		**9.40**		**9.40**		**47.00**

(iii) Improvement of Breeding Efficinecy

The department is making necessary efforts to improve the breeding efficiency of existing livestock by means of Artificial Insemination. However, there is a need to fill up the gap by organizing General Animal Health/Infertility Camps at regular intervals. The health of livestock also requires maintenance of parasite free environment in and around animals which may be achieved by the Ecto and Endo parasites control. The breeding efficiency is regulated by macro and micro nutrients present in the blood which are obtained by animals through feed and fodder. Supplementation of the macro and micro nutrients will improve the breeding efficiency and the animals will be normal in their breeding capability and health. In addition, the maintenance of normal hormonal levels where these are found deficient is of paramount importance.

S. No	Particulars	Ist Year		IInd Year		IIIrd Year		IVth Year		Vth Year		Total	
C	Improvement of Breeding Eddiciency	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**
1	Breeding efficiency improvement through sexual health/infertility camps 2 camps/cluster/Yr. , @ Rs. 8000/ camp	94	7.52	94	7.52	94	7.52	94	7.52	94	7.52	470	37.60
2.	Village level demonstration of parasitic control 2 campus/cluster/year @ Rs. 4000/ camp	94	3.76	94	3.76	94	3.76	94	3.76	94	3.76	470	18.80
3.	Supplementation of minerals micro nutrients, deed additives etc. 500 families/ cluster. 12 kg./family/Yr (6000 Kg/cluster) @ Rs. 3.00 lakh/cluster/Yr.	2828 Qtl.	141.00	2820 Qtl	141.00	2820 Qtl.	141.00	2820 Qtl	141.00	2820	141	14100	705
4.	Hormones, fertility booster/infertility medicines to be provided during the camp at Sr No 1 @Rs. 2000/camp	94	1.88	94	1.88	94	1.88	94	1.88	94	188	470	9.40
5.	Staff refresher course & training 1 person/cluster @ Rs. 5000	47	2.35	47	2.35	47	2.35	47	2.35	47	235	235	11.75
Total			**156.51**		**156.51**		**156.51**		**156.51**		**15651**		**782.55**

(iv) Calf Rearing and Management

It is essential to rear the baby calves and provide them with all essential required health care, nutrition and management till they achieve maturity and also thereafter. The better the animal is reared soon after birth the better it will produce and this will be achieved through scientific calf rearing and managemental practices proposed in the Plan.

S. No	Particulars	Ist Year		IInd Year		IIIrd Year		IVth Year		Vth Year		Total	
D	Calf Rearing and	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**
1	Calf Starter Incentive to be given to female ealves up to the age of one yr. 25 female ealves/cluster/yr. @Rs. 2000/calf of Rs. 50,000/ cluster	1175	23.50	1175	23.50	1175	23.50	1175	23.50	1175	23.50	5875	117.50
2.	Milk replacer incentive to save milk, 25 female calves/cluster.yr. @Rs. 200/Calf or Rs. 5,000/cluster	1175	23.50	1175	23.50	1175	23.50	1175	23.50	1175	23.50	5875	117.50
3.	Protection from diseases and parasite infestation in all calves, 40 calves/cluster/yr. @Rs. 50/calf or Rs. 2,000/cluster	1880	0.94	1880	0.94	1880	0.94	1880	0.94	1880	0.94	9400	4.70
4.	Calf Ralies, one in two cluster/ys. @ Rs. 6,000/rally	23	1.38	23	1.38	23	1.38	23	1.38	23	1.38	115	6.90
5.	Calf ecocentrate ration to female calves for 1 yr. (Up to age of 2 years) 25 female calves of one yr. age/cluster/year @ Rs. 36,000/cluster	1175	16.92	1175	16.92	1175	16.62	1175	16.92	1175	16.92	5875	84.60
Total			**45.09**		**45.09**		**45.09**		**45.09**		**45.09**		**225.45**

(v) Milch Cattle Improvement

In order to provide hygienic and better environment to the livestock, being reared for milk, it is essential to keep them in well suited sheds which keep them healthy and clean and also provide an environment that restricts the appearance of Ecto and Endo parasites and fatal diseases. Proper and timely availability of best treatment not only saves the lives of animals but also keeps the animals in best production state without affecting the economic condition of the livestock owners. The proposed plan will provide such safeguards to the livestock.

S. No	Particulars	Ist Year		IInd Year		IIIrd Year		IVth Year		Vth Year		Total	
E	Milch Cattle Improvement	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**
1.	Improvement o existing sheds, 50 sheds/cluster/year Rs. 1000/shed	2350	23.50	2350	23.50	2350	23.50	2350	23.50	2350	23.50	11750	117.50
2.	Ecto parasitle control in adult animals, 500 animals/cluster/year @ Rs. 40/ animals or Rs. 20,000/cluster	23500	9.40	23500	9.40	23500	9.40	23500	9.40	23500	9.40	47500	47.00
3.	Endo parastitic control in adult animals, 500 animals/sluster/year @ Rs. 40/animals or Rs. 20,000/cluster	23500	9.40	23500	9.40	23500	9.40	23500	9.40	23000	9.4	117500	47.00
4.	Fatel diseases kit for veterinary institutions lying in the cluster, 1 kit/cluster/year @ Rs. 15,000/kit	47	7.05	47	7.05	47	7.05	47	7.05	47	7.05	235	35.25
	Total		**49.35**		**49.35**		**49.35**		**49.35**		**49.35**		**246.75**

(vi) Establishment of Gosadans

The animals of old age and affected with serious reproductive and physical diseases need to rear in Gosadans/ Gosalas so that they could not destroy the cultivated fields. The construction of Gosadans/ Goshalas at panchayat level may not only increase crops production but will also save wastage of fodder. The proposed plan for the establishment of Gosadans/ Gosalas may go a long way in lowering the burden on the farmers.

S. No	Particulars	Ist Year		IInd Year		IIIrd Year		IVth Year		Vth Year		Total	
F.	Establishment of Gosadans	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**	**Phy.**	**Fin.**
1	Establishment of one Gosadans at Panchayat level for housing 25 animals, @ Rs. 10.00 lakh/Gosadan for construction of Gosadan, Water, electricity, Fodder and manpower charges for 4 years.	47	470.00	47	470.00	47	470.00	47	470.00	47	470		2350.0
Total			**470.00**		**470.0**		**470.00**		**470.00**		**470.0**		**2350.0**

(vii) Establishment of Polyclinic

Though, there is a network of veterinary institutions in the district, there is no Central Institution that can provide specialized services for the fatal diseases control, disease management reproduction problems. The establishment of Veterinary Polyclinic may serve the purpose and save the lives of a number of animals that require specialized health cover.

S. No	Particulars	Ist Year		IInd Year		IIIrd Year		IVth Year		Vth Year		Total	
G.	Establishment of Polyclinic in District Una	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.			Phy	Fin.	Phy	Fin.
1	Construction of buildings	1	40.00	-	-	-	-			-	-	1	40
2	Instruments and		5.00		5.00	-	-			-	-		10
Total			**45.00**		**5.00**								**50**

(viii) Development of Sheep

Sheep rearing has not been well accepted by most of the farmers in the district. It needs special care attention. There is plenty of pasture land available for this small ruminant species. The small number of animals (1660) at present, reared by the farmers need to be given special health care. In addition approximately 40,000 sheep and goats make their transit in the district. In the winter season, they move to low plains from alpines. This shows that the fodder resources of the pastures in the district are being used by the sheep rearers from outside the district. The local farmers should take a cue from it. They should increase their flock size of sheep to utilize the pastures for their own benefits.

S. No	Particulars	Ist Year		IInd Year		IIIrd Year		IVth Year		Vth Year		Total	
H	Development of Sheep	**Phy.**	**Fin**	**Phy.**	**Fin**	**Phy.**	**Fin**	**Phy.**	**Fin**	**Phy.**	**Fin**	**Phy.**	**Fin**
1.	Health care for sheep @ Rs. 40/sheep	41660	16.66	41660	16.66	41660	16.66	41660	16.66	41660	16.66	28300	83.30
2.	Drenching Guns, 1 in each Veterinary Aid Institutions @ Rs. 6500/Gun.	32	2.08	32	2.08	32	2.08	32	2.08	32	2.08	160	10.40
Total			**18.74**		**18.74**		**18.74**		**18.74**		**18.74**		**93.70**

(ix) Deveopment of Goats

The low hills of the district have plenty of vegetation that can be better utilized by goats as a source of fodder. Though, the existing population of goats (19460) is being well cared in the district but there a wide scope for increasing the goat rearing activity by establishing intensive goat rearing units so that the un-employeds can make their earnings and uplift their economic status.

S. No	Particulars	Ist Year		IInd Year		IIIrd Year		IVth Year		Vth Year		Total	
I	Goat rearing	**Phy.**	**Fin**	**Phy.**	**Fin**	**Phy.**	**Fin**	**Phy.**	**Fin**	**Phy.**	**Fin**	**Phy.**	**Fin**
1.	Establishment of intensive goar rearing unist (10+1)	20	8.32	20.	8.32	20	8.32	20	8.32	20	8.32	100	41.60
Total			**8.32**		**8.32**		**8.32**		**8.32**		**8.32**		**41.60**

Conclusion

Livestock is the most important allied sub-sector of agriculture with a great potential for growth in the district. To achieve the target growth rate of this sub-sector during the 11th Five Year Plan period, this sub-sector will require genetic upgradation of the milch animals, increasing productivity of the existing milch stock and introducing more milch animals into the district. For that the concerted efforts from the Department of Animal Husbandry and from the Department of Dairy Development are required. Providing education and training to the farmers about modern methods of dairy management and health care of dairy animals, and conversion of milk into milk products can go a long way in the realization of above stated goal.

5.5 Fishery Development

The agro climatic conditions are quite suitable for the aqua farming/fishery in the district. About 300 MT fish is produced annually by 4 fisheries cooperative societies from the part of Gobindsagar reservoir falling in the Una district.

In addition, there are more than 800 rural ponds with average size between 0.2 hect- 2.0 hect, which are perineal to seasonal in nature. These ponds are potential area for the development of aquaculture. More than 50 private ponds, 26 community ponds, more than 80 check dams and waterlogged private lands are suitable for aquaculture. From the above sources, almost 250 hects land is available for fishery, out of which hardly 100 hects is under this activity at present. Hence, the efforts should be made to develop aquaculture in the remaining 150 hect available land.

Una has mainly mirror carp, mahaseer, rohu and grass carp species of fish. The department of fisheries raises fingerlings on their farms and then distributes to the fish farmers. A number of co-operative societies in the district are involved in fish farming and its marketing. Fish catch is regulated by the department. Gobind Sagar Lake, khads and ponds are the major sites for fish culture. There is an ample scope for its development in the district.

Table-5.12
Fish Production in the Una

S. No.	Year	Fish seed	Fish production in MTs		
			Village ponds	Rivers	Tanks
1	2002-03	50000	215	151	138
2	2003-04	100000	259	131	190
3	2004-05	800000	255	130	149

Source: Department of Fishery, Una

Similar to other farmers, the aqua farmers are drawing under ground water for fish farms in the district. The fish farms are getting water from tubewells and artisan bore-wells which are the dependable sources of water. The agro-climatic conditions in the district are quite suitable for aqua farming. Village ponds are also being renovated for the promotion of aqua culture under the guidance of Fish Farming Development Agency (FFDA) and Scheduled Castes Plan (SCP) schemes. The success stories of the following fish farms are showing a way for other farmers to adopt fishery as an independent occupation:

- Toor Fish Farm Panjawar (Una- Gagret road)
    - An integrated fish farm of 10 acres, annexed with piggery and dairy farming. The farm is subsidized under FFDA schemes and technically supported by the fishery department.
- Composite Fish Culture, Ambehra Ram Krishan
    - (Una-Hamirpur road falling in Bangana block). The farm is established by cutting a rocky hill and is getting water supply from lift motor pump.
- Fishery-cum-Poultry Farm, Ramsary. (Una-Amb road) The main aim of this 0.8 hectare farm is to produce eggs and dispose of poultry manure in the fishery farm.
- Composite Fish Farming, Check Dam, Lahar: the check dam is built up by forest department and doing aquaculture with the technical support of fishery department.

- Pisciculture in water logged areas at Nangal Khurd is under construction and 3 hectares fish farming is ready for fish culture in the waste land.
- Integrated Fish Farm, Kuthera Jaswalan (Gagret block) It is an integrated fish farm of 1.5 hectares annexed with piggery
- Integrated Fish Farm Fatehpur/Bhadarkali (Gagret block)
- Aquaculture activities at Polian Prohitan (Amb Block) check dam of 1.07 hectares. Silver carp, Rohu, Mirgal and Catla species have been subjected to pisciculture.
- Check dam, Lam Lehari (Una block). About 1.5 hectare check dam has been subjected to fish farming with fish growth of Silver Carp and Mrigal.
- Check Dam Takarla (Amb block) About 0.5 hectare check dam has been put to composite fish culture in which Common Carp, Silver carp, Rohu, Catla and Mrigal are subjected to aquaculture activities.

The progressive farmers are coming forward to adopt fishery after visting the successful aqua farms. They are interested to adopt aquaculture in their waste lands with permanent water resources.

The department of fisheries is overseen by Director-cum-Warden fisheries at the state level. The administrative structure of the fisheries department from the district to village levels is served by Assistant Director, Senior Fisheries Officer, fisheries officers and field assistants. Total sanctioned posts in the department of fisheries in Una district are 8, out of which one post is vacant. The department performs the main functions as follows:

- Aquaculture Extension;
- Rural Development through fisheries in available aquatic resources; and
- Provision of technical and financial support to fish farmers through subsidy programmes

The following schemes are being operated by the department in Una district;

(i) Centrally Sponsored Schemes

(a) Fish Cart Scheme

(ii) State Sponsored Schemes

(a) Community Pond Development Scheme

(b) Carp Farm Developments for STs beneficiaries

Schemewise detail of the funds shows that the funds available for fisheries development are not sufficient

The scheduled castes households are the main beneficiaries (98 per cent) under the fisheries development schemes. The percentage of women is only 2 per cent. Among the land owning and landless beneficiaries, the marginal farmers are 60 per cent, small

farmers (20 per cent) semi medium (10 per cent) large farmers (2 per cent) and landless (8 per cent).

Since 2005-06, the fishery department has developed 5 community ponds, 8 carp ponds for scheduled tribes and 24 fish carts. The department is developing the panchayat ponds for the expansion of fish cultivation. For this purpose, the department has created a network in coordination with PRIs and NGOs.

The strong points of fishery development schemes show that the schemes are;

- Eco-friendly;
- Employment oriented; and
- Production linked.

The weak points of the schemes are;

- Lack of infrastructure;
- Paucity of technical staff; and
- Poor follow up by the department due to non availability of transport / vehicle facility

There is a general view that the schemes should be open to all the poor households irrespective of their caste. In addition to this, there is a dire need to provide better infrastructure for the promotion of fishery sub sector.

Table-5.13
Year wise detail of finances under different schemes (Rs. in Lakhs)

S. No	Name of scheme	2005-06	2006-07	2007-08	%age of Expenditure 2005-06	%age of expenditure 2006-07	Month in which funds received	Physical & Financial Targets achieved
1.	101-04 (SOOS) community ponds (State Plan)	1.75	3.00	3.00	1.75 (100 %)	3.00 (100 %)	May, 2005&06	achieved
2.	796-05 (AOOS) Dev. & maintenance of carp farms. (State Plan)	0.20	0.20	0.20	0.20 (100 %)	0.20 (100 %)	May, 2005&06	achieved
3.	101-04 (AOOS) Fish cart scheme (centrally sponsored)	0.60	0.60	-	0.60 (100 %)	0.60 (100 %)	May, 2005&06	achieved
4.	**Total**	**2.55**	**3.80**	**3.20**	**2.55**	**3.80**		**100 %**

Source: Department of Fisheries, Una

Table-5.14
Year-wise detail of finances under different schemes (In Rs.)

S. No.	Name of scheme	Amount of grant received during			Actual and percentage of expenditure			Month in which funds were received	Physical and financial targets achieved
		2005-06	2006-07	2007-08	2005-06	2006-07	2007-08		
1.	State sponsored schemes	28873100	35620900	42339700	28873053 (99.99)	35620847 (99.99)	42339701 (100.00)	May	Achieved
2.	Centrally sponsored scheme	110000	89000	84000	117681 (99.72)	88791 (99.76)	83962 (99.95)	May	Achieved

Source: Department of Fisheries, Una

(i) Aquaculture in Swan River

The existing aqua farms in the district have created a positive impact on the minds of the other progressive farmers and they are coming farward to adopt fisheries as an occupation and harnessing its potential with technical know-how, provided by the departmental experts. Now the aquaculture in the district is being adopted by a number of farmers, having waste lands with permanent water resources.

With financial support, provided under Swan Channelisation Project, the fishery department was asked to develop fisheries in 500 hects reclaimed land. The project was initiated in 2003-04 and 2.0 hect areas were targeted to start with trials for exploring the possibilities of fish culture and developing technologies to establish aqua farm in sandy parts of the reclaimed land. Seven ponds have been excavated by the farmers after eradicating weed fishes. These ponds are resorted for polyculture practice. High densities of fish fingerlings comprising of rohu, catla, mrigal, and grass carp species are stocked. As the ponds were full of water weeds, the biological control measures were selected to control the growth of water weeds. Excellent growth responses as reported by the fish farmers, clearly show the future prospects of the aquaculture in this project. With the success of these experiments, the indigenous technologies are also being developed by the aqua farmers in other parts of the district as well as in the Swan area. More and more farmers, who have their land holdings in the project area, are coming forward to adopt the fish culture under this project. Another 35 ponds, covering almost 8 hectares area have been excavated in the reclaimed land of the project area. With availability of funds from the nodal agency i.e. I&PH Department Flood Control Division Gagret, more units will be established in the project area.

Cat Fish Culture

Another aquaculture activity of Cat Fish Culture is being undergoing at Panjawar in Una district – first time in Himachal Pradesh. The Fish Cat has high nutrition value and also

getting high price in the market which is almost three times more than the price of other species. Cat Fish can withstand the high temperatures; low dissolved oxygen conditions and high organic loads in the village ponds. This culture can bring most of seasonal ponds available in the district for fish culture and will help to extend aquaculture in the remotest villages of the district and making fishery a profit making activity.

Another Cat Fish i.e. magur has also been subjected to culture trial under A TMA project in the Swan area. 1000 fingerlings of magur specie have been stocked in a pond falling in project area and still under observation to study the percentage survival. This specie is equally costly and can fetch more earnings to the aqua farmers in the district. The specie is a scavenger and eats up all the animal wastes. It is highly advantageous to the aqua farmers and has high demand in the market, as it is boneless and its demand is more among consumers.

Fresh Water Pearl Culture

Himachal Pradesh is pioneer state in north India to introduce a modern technology for the development of freshwater pearl culture. The department of fisheries has succeeded in developing highly precious and rare pearl lockets in the body of freshwater mussels available in the Swan river and its tributaries, originating from Solah Singhi Dhar of the district. Field trials are in progress to develop different colored and 8mm sized freshwater pearls. This effort will definitely improve the economy of the farmers.

Extension and Training

The important factor that plays a significant role in the promotion of fisheries is the organization of awareness and training camps in the villages or at the block level or in the potential areas. A Computer, Projector and other equipments required for extension activities have been provided by the project authorities to strengthen the extension activities for the promotion of fisheries in scientific way. Training camps are being organized for those fish farmers who have their lands in swan area about aqua culture practices. A total of 35 ponds have been excavated in the project area and fish culture has also been started.

(ii) Fish Farming Development Agency (FFDA)

Keeping in view the potential of aquaculture and the scope of pond fishery in the district, the Ist FFDA of Himachal Pradesh was established at Una. A significant role has been played by FFDA for the development of pond fishery. To fulfill the rising demand of fish seed, 264 kanal fish seed farm was established at Deoli near Gagret. Fully developed infrastructure consisting of 20 rearing ponds, 4 culture ponds and more than 20 nurseries, office building, residential quarters with dependable water supply from a tubewell with pump house was created at this farm. The farm started producing seed and rearing of IMC

seed and stocking in the Pong reservoir and Chamera dam, apart from the seed supply to the local farmers. Due to some administrative reasons, FFDA was first shifted to Bilaspur and then Kangra and now it is being looked after by FFDA Solan. As a result of this instability, the pace of pond culture slowed down, after that the farm was leased out to a Chandigarh based firm.

Although, the pond culture in the district suffered a lot, but FFDA has already done a remarkable job to make aquaculture a success in the district. In addition, big fish farms are brought up with the financial and technical support of FFDA. The aquaculture development has again got momentum with the start of Swan project in the recent past. The restart of the training of farmers on fishery development in Gagret and Bangana areas has reinforced the concept of fish culture. Toor fish farms at Panjawar, Rana Fish Farm at Behdala etc are the best success stories of aquaculture in this district, brought up by FFDA.

(iii) Fish Culture in Village Ponds

FFDA is not only providing technical and financial help in the development of new fish farms but also help similarly renovating the village ponds for the promotion of fish culture. With the development of common ponds for fishery, tough bidding competitions may be seen in the villages for leasing in the ponds for fish culture. Singa village in Haroli Block is a good example, where annual lease amount of Rs.l6,000 has been paid by the aqua farmers to the gram panchayat. It shows the viability of pisciculture in village ponds which are generating employment to the locals. On an average, 3-5 ponds, seasonal or perennial may be counted in each village of the district. Some of the ponds have been developed under Scheduled Caste Component Plan where as others under Community Ponds Scheme and the remaining ones under FFDA schemes

Constraints

Despite the rapid growth of aquaculture in the district, the sector is facing problems/constraints in its fast development and popularity. These are:-

- The fish farmers are paying heavy electricity bills for their tubewells, installed at fish farms on the grounds that aqua farming is not considered as agro allied activity by the state electricity board and hence they are forced to pay the commercial charges on it;
- Rural ponds can be revived by irrigation supply scheme of I & PH department running in the villages. On the contrary, I & PH Department do not consider this sector as part of agriculture sector and do not supply water from their schemes to ponds;
- The department does not have its own aqua clinic which could cater the demand of fish farmers for water quality management, soil testing needs and disease diagnosis;

- Non-availability of good quality seed, feed, probiotics, growth hormones and other inputs also inhibits the smooth growth of fishery sub-sector;
- Lack of independent FFDA for Una district is also hindering the pace of aquaculture development in the district;
- Inadequate and trained extension staff is the ultimate hurdle on the way to bring more and more farmers under the fold of aquaculture schemes; and
- Non availability of vehicle at the district level office is one of the major hurdles in the development of aqua culture in the district despite the immense scope of fisheries in the district.

Suggestions to deal with constraints

- The fishery schemes should not be caste specific rather these should be universal to every caste in the village;
- The maximum limit of Rs. one lakh to each pond for development should be relaxed and be linked to actual cost of development as per estimate framed by aquaculture engineer; and
- Each division should be permitted to hire one aquaculture engineer on contract basis for the project period.

5.6 Development of Wastelands and Watershed Development Programme

Wasteland can be defined as degraded lands which can be brought under vegetative cover with reasonable efforts and which are currently under-utilized, and also the land which is deteriorating for lack of appropriate water and soil management or on account of natural causes. In order to undertake developmental activities to reclaim wastelands, it was felt necessary to map the wastelands to identify wastelands and their location upto the village and micro-watershed level. The wastelands were classified statewise using satellite data. National Wastelands Updation Mission initiated in 2003, carried out mapping of wastelands across the country over the period of two years during 2003-05 using one time IRS data and brought out Wastelands Atlas of India-2005. As per that Atlas the state of Himachal Pradesh has 50.9 per cent (28336.8 squ. Kms) of its total 55673 squ kms geographical area as wastelands. All the 12 district of the state has wastelands area.

No doubt, the Area Development Programmes namely DPAP, DDP and IWDP were already in operation for the development of waste lands, but after the implementation of the 73rd & 74th constitutional amendments in 1992, it was felt that there is a dire need to make suitable modifications and amendments in the operational strategy of the waste lands development schemes.

A new initiative called Haryali with an objective of empowering PRIs, both financially and administratively, was taken by the department of Land Resources in the Ministry of

Rural Development, to implement Watershed Development Programmes (under Haryali Scheme) in the country. Under this initiative, all ongoing area development programmes would be implemented through PRIs. The salient features of watershed development programmes implemented for Haryali in 2003, are as under.

- Focus on village common lands;
- Equity in sharing the benefits;
- Community participation at the village level for implementation and post project maintenance;
- Emphasis on sustainable rural livelihood support system through SHGs and User Groups;
- Capacity building as a vital component;
- Committee system at the state and district level monitoring and implementation; and
- Decentralized planning and decision making by the local people of the wasteshed area.

Now under Haryali, Watershed Development has been included in the list of subjects to be develoved to PRIs. New projects under the ongoing area development programmes would be implemented through PRIs.

Table-5.15
Block wise List of Watersheds under DPAP/ Haryali in Una District

Year	Block	Amb			Bangana			Gagret		
		No. of DPAPs	Targeted Area (hects)	Total Cost (Rs Lakhs)	No. of DPAPs	Targeted Area (hects)	Total Cost (Rs Lakhs)	No. of DPAPs	Targeted Area (hects)	Total Cost (Rs Lakhs)
2001-01	6th	16	8000	480	11	5500	330	2	1000	60
2001-02	7th	5	2500	150	4	2000	120	4	2000	120
2002-03	8th	5	2500	150	5	2500	150	5	2500	150
2003-04	9th	4	2000	120	4	2000	120	4	2000	120
2004-05	10th	4	2000	120	4	2000	120	4	2000	120
2005-06	11th	5	2344	150	5	2467	150	5	2488	150
2006-07	12th	5	2500	150	5	2500	150	5	2500	150
Total		**44**	**21844**	**1320**	**38**	**18967**	**1140**	**29**	**14488**	**870**

Contd…..

Harali			Una			Total		
No. of DPAPs	**Targeted Area (hects)**	**Total Cost (Rs Lakhs)**	**No. of DPAPs**	**Targeted Area (hects)**	**Total Cost (Rs Lakhs)**	**No. of DPAPs**	**Targeted Area (hects)**	**Total Cost (Rs Lakhs)**
4	2000	120	7	3464	210	40	19964	1200
3	1500	90	4	2000	120	20	10000	600
5	2500	150	5	2500	150	25	12500	750
4	2000	120	4	2000	120	20	10000	600
4	2000	120	4	2000	120	20	10000	600
4	2000	120	4	1935	120	23	11334	690
4	2000	120	4	2000	120	23	11500	690
28	**14000**	**840**	**32**	**14000**	**960**	**171**	**85298**	**5130**

Source: Department of Soil Conservation, Una

Integrated Watershed Management Project in Una district (Swan River Project)

An IWDP for Swan River has been started with a total cost of Rs 160 crores. The financial help for this project is provided by the government of Japan. The project period is 8 years (April 2006-March 2014). The objectives of this project are as follows:

- regeneration of forest
- protection of agricultural land; and
- increase in agricultural and forest production

To fulfill these aims, the watershed management activities viz. forestry, soil and water conservation works/activities are being carried out in the catchment area of Swan River. Similarly, the works with regard to the development of agriculture and improvement in the livelihood of local people are also been undertaken. Forest department has prepared a detailed project report of Rs 135.00 crore. The main aim of this project is to reduce soil erosion and watershed catchment treatments of 73 tributaries of Swan river to reduce the water traffic to the main Swan River.

5.7 Social Forestry Development

Himachal Pradesh has a forest cover of 37,033 squ. km area and form 66.5 per cent of the total geographical area of the state. The developmental programmes of the Forest Department aim at fulfilling the policy measures, conservation of forests along with rational utilization and expanding the forest base in the state. The forest plantation in the state is being carried out under Productive Forestry Schemes and Soil Conservation Schemes. These Schemes include improvement of tree cover, raising nurseries for departmental plantation and public distribution, pasture improvement, fuel and fodder, minor forest produce, Sanjhi Van Yogna, Backward Area Sub-Plan and Soil and Moisture Conservation.

In addition to the existing schemes, another scheme; namely Wild Life and Nature Conservation Scheme has been initiated to improve the habitat and facilitate sanctuaries & national parks and to afford protection to the various species of birds and animals facing extinction.

The department has established the check posts at suitable places to curb illicit timber trade, illicit felling and encroachments. Fire fighting equipments and techniques has also been introduced; these are available to all the forest division where fire is a major destructive element.

Una Forest Division, which was established in 1966 has five ranges with their headquarters at Una, Bharwain, Amb, Ramgarh at Khurwain and Bangana. These ranges are further divided in 18 Blocks, 66 Beats and 9 Check posts.

Table-5.16
Forest Cover in Una District (hectares)

Year	Reserved Forests	Protected Forests	Unclassified	Other Forests	Total
2002-03	4392	4447	12409	26530	47778
2003-04	4392	4447	12409	26530	47778
2004-05	4392	4447	12409	26530	47778
2005-06	4392	4447	12409	26530	47778
2006-07	4392	4447	12409	26530	47778
2007-08	4392	4447	12409	26530	47778

Source: Department of Forests Una.

Table-5.17
Value of Major and Minor Forest Produce (Rs. '000)

Year	Major Minor						
	Timber	Fuel	Charcoal	Chil Fuel	Khair	Biroja	Others
2004-05	11.902	1.18	8.99	19.37	26.73	57.82	3.14
2005-06	49.54	0.27	1.37	5.30	14.34	92.87	-
2006-07	6.26	0.55	11.62	13.15	32.46	126.14	-
2007-08	8.39	1.03	9.42	12.20	39.05	128.02	-

Source: Department of Forests Una

The forest department in the district is working under the overall supervision of principal chief conservator of Forests, Shimla. The district office is located in Una. Against 230 sanctioned posts in the department, the existing number of posts is 257 (31 temporary forest workers have been regularized in 2007). The main functions of the department are;

- Forest Farming;
- Conservation of forests; and
- Development of forests.

The department is operating the following schemes;

(i) Centrally Sponsored Schemes

- Forest Development Agency
- National Bamboo Mission
- Integrated Forest Protection Mission

(ii) State Sponsored Schemes

- 2402-Plan
- 2406-Plan
- 4406-Plan

The schemewise details

Table-5.18
Scheme wise detail of Funds in Una forest division (In Lakh)

S. No.	Scheme	Funds received				Actual percentage of expenditure			
		2005-06	2006-07	2007-08 (Included balance 12.94 of 2006-07)	2008-09	2005-06	2006-07	2007-08	2008-09
(I)	**Centrally Sponsored Schemes**								
a.	Forest Development Agency	41.35	54.08	57.96	31.98	41.35 (100 %)	41.14 (76%)	25.96 (44.8 %)	17.32 (54.15 %)
b.	National Bamboo Mission	-	-	15.62	-	-	Work in Progress	Work in Progress	Work in Progress
c.	Integrated Forest Protection Scheme	5.88	2.67	6.51	-	5.88 (100 %)	2.67 (100 %)	6.51 (100 %)	-
(II)	**State Sponsored Scheme**								
a.	2402-Plan	4.71	5.36	2.28	-	4.71 (100 %)	5.36 (100 %)	2.28 (100 %)	-
b.	2406-Plan	169.57	163.90	221.08	-	169.57 (100 %)	163.90 (100 %)	221.08 (100 %)	-
c.	4406-Capital Section	1.0	2.7	3.0	-	1.0 (100 %)	2.7 (100 %)	3.0 (100 %)	-

Source: Department of Forest, Una

The following development schemes are being run in Una division;

1. Forest Development Agency (FDA)

First Phase of FDA Project was approved by the Ministry of Environment and Forests, Government of India under National Afforestation Programme in 2003-04 through which plantation on 960 hectares and other development activities were to be carried out in 26 selected villages/sites, with an expenditure of Rs.144.35 lakh. During 2005-06 an amount of Rs. 41.35 lakh was spent for new plantations on 345 hectares and other development activities had also been carried out. For the plantation of 285 hectares and development activities, an amount of Rs.41.14 lakhs was spent in 2006-07. After successful completion of first phase the Government of India approved 2nd phase in 2006-07 for a period of 5 years, in the 2nd phase, plantation on 600 hectares and other developmental activities will be carried out through 21 JFMC. The plantation raised under Ist phase will also be maintained by 27 JFMCs (constituted under Ist phase) on which Rs 158 lakhs will be spent. An amount of Rs 39.54 lakh has been utilized for raising plantations on 310 hect area, soil conservation works and overheads in 2007-08.

2. Jatropha Project

A project, namely, Jatropha Project was approved by the Ministries of Rural Development and the Land Resource Development for the development of Jatropa cultivation. An amount of Rs. 18 Lakh was given to District Rural Development Agency (DRDA) Una in 2006-07 for raising 6 lakh Jatropha seedlings in nurseries. Till December 2008 about 10.85 lakh Jatropha seedlings were raised in nurseries and then distributed/supplied to DRDA, Public, Govt. departments for planting in private lands as well as public lands.

3. Swan Project

Under the Swan River Integrated Watershed Management Project, the advance works on more than 500 hects were carried out in 2006-07 and the plantation over an area of 543

hectares was raised in government forests in 4 of the 5 Ranges i.e. Bharwain, Amb, Ramgarh and Bangana of the Division in 2007-08. In addition the advance works and soil convervation activities have also been done in 500 hectares of the total 543 hectares.

Table-5.19
Year wise abstract of activities on forest development from 2005-06 to 2008-09

S.No.	Year	Activity	Target		Achievement	
			Phy	Fin (lakh)	Phy	Fin (Lakh)
1.	2005-06	Afforestation	795	143.07	795	143.07
2.	2006-07	Afforestation	878.6	80.34	881.6	80.34
		C/O FRH	1	1.0	Part	1.0
Total:2006-07			-	**81.34**	-	**81.34**
3.	2007-08	Afforestation	921.33	91.23	917.33	90.40
		C/O FRH	Part	3.0	Part	3.0
		Advance works	500 ha	18.50	500	18.50
		Repair of Building	10 No.	6.50	10 No.	6.50
		Soil Conservation works	379 No.	55.73	379	55.73
Total:2007-08				**174.96**		**174.13**

Source: Department of Forest, Una

Table-5.20
Detail of various activities on forest development in Una (2005-06)

Name of Scheme	Target fixed		Achievement	
	Phy	Phy	Fin (in lakh)	Fin (in lakh)
Normal Afforestation	186	190	29.56	29.56
SCCP Schedule castes Compact Plan	104	104	13.75	13.75
BASP (Backward area sub-plan)	4	4	0.72	0.72
Swan Cat Plan. Aff. & Other activities	10	10	3.79	3.79
Sanjhi Van Yojana	15	15	3.51	3.51
PDA	345	345	41.35	41.35
DFID Project	131	131	36.49	36.49
Main of Preservation of Forests (TFC)	180	225	13.90	13.90
Grand Total 2005-06	**795**	**799**	**143.07**	**143.07**

Source: Department of Forest, Una

Table-5.21
Detail of various activities on forest development in Una (2006-07)

Name of Scheme	Target fixed (ha)	Achievement (ha)	Financial Allocation	Financial Achievement
24(9-F & Willife Plan 102-Social & Farm Forestry o4-Improvement of Tree Cores			(Rs)	(Rs)
Afforestation Scheme	114	117		
Enrichment Scheme	107	107		
Re afforestation of Scrub area	39	39		
Total	260	263	3440600	3440600
18-Social Forestry Programme				
Backward Area Sub Plan	4	4	68400	68400
Total-18	4	4	68400	68400
8% Prot & Preservation of Fts.				
IFC	180	180	161292	161292
Total-3	180	180	161292	161292
2402 Soil and Water cons. plan				
12 Protection Afforestation	24	24	360000	360000
Total-12	24	24	360000	360000
Compensator Afforestation	31.6	31.6	479160	479160
Total: comp. Afforestation	31.6	31.6	479160	479160
DFID Project	89	89	911200	911200
Total: DFID	89	89	911200	911200
Sanjhi van Yojna	5	5	85500	85500
Total: Sanjhi Van Yojna	5	5	85500	85500
FDA Project	285	285	1070000	1070000
Total Planning:2006-07	878.6	881.6	8034152	8034152
Construction of FRH at Panjawar	1No.	Part	100000	100000
Grand Total:2006-07			8134152	8134152

Source: Department of Forest, Una

Table-5.22
Detail of various activities on forest development in Una (2007-08)

Name of Scheme	Targets fixed (ha)	Achievement (ha)	Financial Allocation	Financial Achievement
2406 F & Willife Plan 102 Social & Farm Forestry 04 Improvement of Tree Cover			(Rs)	(Rs)
Afforeststion Scheme	18	18		
Enrichment Plantation	15.2	15.2		
De afforestation of Scrub areas	4	4		
Total:04	**37.2**	**37.2**	**423000**	**423000**
08 Social Forestry Programme			0	0
Backward area Sub Plan	6	6	0	0
Total:18	**6**	**6**	**102600**	**102600**
Swan Project			0	
Afforestation (Completion	543	543	6349453	6349453
Advance works	500	500	1850000	1850000
Minor works (Repair of Buildings)	10 No.	10 No.	650000	650000
Soil Conservation works	379 No.	379 No	5573347.	5573347
Total: 102-28			**14422800**	**14422800**
31 Prot & Preservation of forests			0	0
IFC	17	17	190740	190740
Total:31	**17**	**17**	**190740**	**190740**
2402 Soil and water Cons Plan			0	0
12 Protective Afforestation	8.13	8.13	0	0
Total-12	8.13	8.13	97000	97000
FDA Project			0	0
Afforestation (Completion)	310	304	1960000	1877415
Grand Total Planting:2007-08	**921.33**	**915.33**	**9122793**	**9040208**
Construction of FRH at Panjawar	**1 No.**	**Part**	**300000**	**300000**
Exp. On item No.3 (II,III,IV only)			**8073347**	**6349453**
Grand Total:2007-08			**17496140**	**17413555**

Source: Department of Forest, Una

Lantana Eradication and its Management through Participatory Approach

Una district has almost 12 per cent forest covered area, which is the major wealth of the district. The invasion of weeds like Lantana Camera, Ageratum and Parthenium has reduced the growth and development of forest trees. A native plant of Cuba in tropical America, *Lantana* was taken for plantation in India from Australia in the beginning of 19th century as an ornamental plant. Thereafter, it spreaded over other parts of the country including Himachal Pradesh. Presently, the common grasslands and denuded forests of Una, Amb, and Gagret and Bangana blocks of the district are infested with Lantana. Lantana is named as *Panch Phool Lal Phulanu Chudail Booti* etc. in local language. It propagates by seeds, stems and roots disseminated by birds, men and machinery, and invade pastures, grasslands and other non cropped areas.

Table-5.23
Blockwise Lantana Infected Area in Una District

Block	Total forest Area (Hects.)	Lantana Infested Area under common land		Lantana Infested Area under farmer's own land	
		Area (Hects.)	Per cent	Area (Hects.)	Per cent
Amb	20766	2110	10.2	1633	7.9
Bangana	21483	3618	16.8	2928	13.6
Gagret	23289	2913	12.5	2664	4.4
Haroli	26576	4182	15.7	2196	8.3
Una	18020	1380	7.7	1118	6.2
Total	110134	14203	12.9	10539	9.6

Source: Krishi Vighyan Kendra, Una

It has become compulsory to control *Lantana* for the necessary survival and growth of new plantation. The check measures, taken for the eradication of *Lantana*, would naturally reduce the risk of forest's fires and spread of *lantana* weed to surrounding cultivated areas. KVK Una is already organizing motivational camps to control *"Lantana"*. But there is need to accelerate the process of mass awareness campaign to control this weed.

5.8 Agro-based Rural Deveopment Programmes

The necessary condition for the development of agriculture and allied sectors is the value addition of crops/products through agro-processing. As, the agro-based industries are lacking in the district, therefore, the growers of foodgrains, fruits and vegetables, producers of milk, bee keepers have to sell their produce in raw form at cheap rates.

Besides, the food and horticulture gaps the district has abundence of grasses like babhar grass, buckle ghas etc. It is difficult to make ropes/ban manually. Therefore, availability of ban making machines has become a necessity under agro-processing industries in the district. The district has a vast scope of the following agro-based enterprises;

- Horticulture particularly mango fruit related units of pickle, amchoor making etc.;
- Milk and milk based units;
- Katha making units;
- Coal making units;
- Baroja units;
- Honey processing units; and
- Rope making units.

5.9 Food Processing Units

There are just a few horticulture based food processing units in the district and they are using low grade technology for food processing (see table 5.46).Due to conducive agro climatic conditions, the district, alike the state, has tremendous scope for the production of horticulture products and off season vegetables, tomatoes peas, cauliflower, cabbage and seasonal fruits like mango, pear, lemon, kinnow etc. There is a large scope for expanding and intensifying food processing industries. Horticulture can play a vital role in improving the socio-economic conditions of rural population through employment generation. In addition to horticulture, the milk based, ceral based and forest based agro-industrial units have a good scope in the district. Therefore, there is need to;

- Integrate the farming processing industry and marketing i.e vertical integration of different activities across the agro-business chain; and
- Agri-parks and clusters should be set-up by facilitating modern infrastructure, latest processing and packaging techniques and required training to the stakeholders.

Table-5.24
Horticulture Based Food Processing Units

Sr. No.	Name of Block	Name of Unit	Location of processing unit	Product manufactured	Commodities processed	Installed capacity (MT)	Quality processed (MT)			Turnover (Rs. in Lakhs)		
							2000 - 01	2001-02	2002-03	2000-01	2001-02	2002-03
1.	Amb	M/S Shivambu International Mahesh Nagar The Amb	Mahesh Nagar The Amb	Jam, Juices, Pickles, Tomato Catchup etc.	Tomato, Vegetables, Mango, Apple & Citrus	2500	2493.3	2395.9	2571	864.50	838.60	889.30
2.	Una	M/S Triveni Food Product Unit Mohalla Gurusar, Una	Mohalla Gurusar, Una	Pickle, Sharvat, Jam, Tomato Catchup etc	Tomato, Vegetables, Mango, Apple & Citrus	50	45	40	38	15.00	12.67	13.34
3.	Una	M/S Himgiri Food Production Main Bazaar Una	Main Bazaar Una	Mango, Citrus, Apples	Mango, Citrus, Apples	20	17	14	15	5.60	4.67	5.00
4.	Bangana	M/S Channe Foods Samoorkalan, Tehsil Bangana	Sammoorkalan Tehsil Bangana	Tomato, Vegetables	Tomato vegetables	30	10	15	18	3.00	5.00	6.02
5.	Haroli	Crimika Agro Food Pvt. Ltd Tahliwal District Una	Tahliwal	Wheat	Wheat	2400						

5.10 Development of Rural Industries

Industrialization is a recent phenonon in Himachal Predesh. It gained momentum during the last two decades. The reasons were the incentives and subsidies to this sector, provided by the state as well as the central governments. The industries in Himachal Pradesh now exist in the form of traditional to a wide spectrum of high tech products. The units of processed food, textiles and spinning products are integral part of the state's industry. The contribution of industry as manufacturing sector in the Gross State Domestic Product (GSDP) in 2006-07 was 11.36 percent (at current prices). The state had 2743 factories in 2006, providing employment to 1, 37,496 workers.

Una district had 132 industries, generating employment for 5547 workers in 2006. The number of small scale industrial units registered on permanent basis was 96 in 2007-08 and the number of workers in these units was 849. Una district has 12.6 percent of the total small scale units in the state (952) in 2006-07. As we know that industrial development in the state is uneven. The periphery districts of Solan, Sirmaur, Una, Kangra, Mandi etc. are better developed industrial districts. About 60 percent of the overall and 95 percent of the large and medium units are concentrated in these districts. Even within the periphery

districts, the districts of Kangra and Una are less developed and come under the category of backward districts.

Table-5.25
Groupwise detail of units in Large and Medium Units in Una and Himachal Pradesh (2003)

S. No	Particulars	Una (Nos)	Himachal Pradesh (Nos)
1	Food Products	1	27
2	Beverages	1	6
3	Textiles/Spinning	1	23
4	Chemical & Chemical Products	1	27
5	Engineer	-	10
6	Non Metallic Mineral Products	-	2
7	Electronics	-	27
8	Steel & Steel Products	2	31
9	Paper and Paper Products	2	19
10	Cement	-	8
11	Leather and Feaner products	-	2
12	Ceramic	-	1
13	Plastic Products	-	5
	Total	8	194

Source: District total Industries Himachal Pradesh

Out of total 30 industrial areas and 10 industrial estates in the state during 2002, Una had four industrial areas namely Mehatpur, Tehliwala, Amb and Gagret. In addition to the already existing industrial areas and estates, the small and medium scale industry clusters can be set up at different places in the district. The small clusters can cover different products mainly based on local raw material.The following industrial activities can be recommended for Una.

Shawl making, furniture, hosiery, leather products, card board boxes, herbal processing, engineering agriculture implements, milk products, food products, pickles, jam etc.

But it will not be out of place to mention here that tax holiday to industry in Himachal Pradesh is coming to an end on 31-03-2010 and income tax holiday in March 2012. As such the industry in Himachal Pradesh at present is in a state of uncertainty. The neighbouring states of Punjab and Haryana are also pressurizing the central government not to extend tax holiday to industry in Himachal Pradesh. The industrial sector in Himachal Pradesh as well as Una district will get a setback if the tax-holiday to industry is not extended beyond 31-03-2010.

5.11 Agricultural Markets

As the agriculture is the main source of income in Himachal Pradesh, therefore, here the farmers have to sell their surplus marketable agricultural produce in regulated markets falling in the state and sometimes in the bordering states of Punjab and Haryana. The regulated markets perform a vital role for the proper marketing of agriculture produce. Una district has only one regulated principal market yard, located at Una. It provides marketing facilities to the growers of the district. Market Committee has constructed one Sub Market Yard at Santoshgarh but it is non-functional till now. In fact, the marketing

facilities are not wide spread in the district as in the neighbouring state of Punjab. The farmers of the district have to depend on the principal market yard of Una. They have to cover long distances to sell their produce in this market.

In addition, the principal market yard of Una needs renovation and modern facilities on priority basis.

While interacting, the farmers suggested the following measures for improving the agricultural marketing in the district;

- Construction of sub market Yards with modern facilities at each block headquarter or central villages of the block;
- Repairing of Link roads; and
- Construction of godowns at sub market level.

5.12 Agricultural Credit

Traditionally, non-institutional sources of finance have been the major source of finance for the rural households. Due to their poor socio-economic condition, the rural households had to borrow money at higher/exorbitant rates of interest from the money lenders. After independence, the government took revolutionary steps in strengthening institutional sources of finance through co-operatives, banks and public sector financial corporations. Similarly, the government of Himachal Pradesh took special measures to ensure timely and adequate supply of institutional credit to rural households at reasonable rates of interest. Keeping in view the requirement of agricultural households, most of whom are marginal and small farmers, the government is focusing on special programmes/schemes to ensure credit through co-operatives and banks to purchase inputs. Institutional credit is being extensively disbursed by formal finance institutions. There is a further scope to increase the credit, particularly in respect of the crops for which insurance cover is available. Providing better access to institutional credit for small and marginal farmers to adopt modern technology and improved agricultural practices has been one of the major objectives of the government.

The formal finance institutions particularly, the Commercial banks, the Co-operative banks and the Rural Regional Banks have played a major role in the development of rural economy in the country. These institutions are crucial for the implementation of developmental strategies, chalked out to speed up the growth of the agriculture and allied activities. The banks, both commercial and cooperative, are disbursing short and long term credit to the farming community to purchase farm machinery and other inputs for increasing agriculture production and to decrease unnecessary variable costs.

Although there was a significance increase in the Credit-Deposit Ratio in the district during 2002-03 to 2006-07, yet the Credit Deposit Ratio is still very low and is stagnating since 2006-07 (see table-5.25 a). There is a need to enhance this ratio by providing liberal loan to agricultural sector and agro-industries.

Table-5.25 a
Himachal Pradesh –District-wise Credit-Deposit Ratios, 1997-98 to 2008-09

Districts	**1997-98**	**2001-02**	**2002-03**	**2006-07**	**2007-08**	**2008-09**
Bilaspur	18.83	18.91	20.37	31.95	33.11	33.61
Chamba	19.27	17.46	18.26	33.17	35.68	33.29
Hamirpur	13.19	13.32	15.13	23.94	24.52	22.87
Kangra	14.22	15.73	17.63	28.51	28.21	26.51
Kinnaur	21.10	16.64	15.57	40.12	42.50	41.87
Kullu	31.41	36.29	37.93	56.27	57.87	58.28
L-Spiti	10.25	10.90	12.50	17.28	20.45	19.44
Mandi	24.83	22.08	23.95	37.97	39.15	35.69
Shimla	15.44	27.58	26.52	48.46	47.66	34.99
Sirmaur	37.40	39.89	43.93	67.93	80.57	88.02
Solan	54.82	43.03	50.21	58.84	73.15	68.42
Una	18.78	15.31	16.64	31.43	31.22	31.66
Himachal Pradesh	**21.60**	**23.04**	**24.70**	**41.52**	**43.63**	**38.55**

Source: Mid-Term Appraisal of the Eleventh Five Year Plan of Himachal Pradesh

In the present situation, their role has become more important as the agriculture sector is on the cross roads and passing through a transitional phase to make itself competitive in the post liberalized global economy.

The government of India constituted a committee known as “Vaidyanathan Committee” to suggest improvements in banking sector for the development of agriculture and allied sectors and also to increase the share of formal financial institutions in the credit flow for agriculture. On the lines of the recommendations of Vaidyanathan committee, the government of Himachal Pradesh has already taken some innovative steps for strengthening the short term credit structure in the state and to make it well managed and vibrant medium to serve the credit needs of rural households particularly of the agricultural sector. It seeks to; (i) provide financial assistance to bring the system to an acceptable level; (ii) introduce legal and institutional reforms necessary for their self democratic, self-reliant and efficient functioning; and (iii) take measures to improve the quality for management.

Una district has 374 Primary Cooperative Societies, [219 are Primary Agricultural Cooperative Societies (PACSs)], 53 branches of Commercial banks, 22 of Co-operative banks, 4 of Land Development Banks, 3 of Regional Rural banks and one branch of Private bank (ICICI), catering the needs of both agriculture and non-agriculture sectors.

Table-5.26
Block wise detail of formal Financial Institutions in Una (2006-07)

Sr No.	Particulars	Blocks					
		Amb	Bangana	Gagret	Una	Haroli	Total
1	Commercial Banks	14	9	6	17	7	53
2	Co-operative Banks	5	4	3	7	3	22
3	Land Development Banks	1	1	-	1	1	4
4	Regional Rural Banks	2	-	-	1	-	3
5	Private Banks (ICICI)	-	-	-	1	-	1
7	Primary Co-operative Societies (Primary Agri Cooperative Societies)	-	-	-	-	-	374 (219)

Source: (i) District Credit Plan 2007-08
(ii) Statistical Abstract Una

Table-5.27
Year wise detail of Primary Agricultural Cooperative societies in Una district

Sr No.	Particulars	2004-05	2005-06	2006-07
1	No. of PACSs	220	219	219
2	Membership	122007	149711	171806
3	Share Capital (Lakhs)	620.93	983.09	1205.90
4	Working Capital (Lakhs)	13254.72	20794.26	27776.11
5	Advance Loans (Lakhs)	2217.71	3874.14	5926.42
6	Balance Loans (Lakhs)	1934.03	4604.18	7027.02

Source: Statistical Abstract Una

Table-5.28
Detail of Banks Deposits & Advances in Una district

Sr No.	Particular	2006-07				2007-08			
		No. of Banks	Deposits (Lakhs)	Advance (Lakhs)	CD Ratio	No. of Banks	Deposits (Lakhs)	Advance (Lakhs)	CD Ratio
1	Commercial Banks	53	1026.00	323.15	31.5	53	1191.15	377.48	31.7
2	Kangra Cooperative Bank	22	431.92	99.79	23.11	22	490.09	116.72	23.82
3	Land Development Bank	4	-	11.30	-	4	-	12.08	-
4	Regional Rural Bank	3	14.16	6.69	47.24	3	17.58	6.96	39.60

Source: District Credit Plan 2007-08

The performance of banks as shown in the above table indicates that the Credit Deposit (CD) ratio is not investment oriented. Further more, the performance of the Co-operatives and RRBs is also not much satisfactory, particularly for agriculture sector.

Credit Plan

The Annual Credit Plan (2006-07) of Una district envisaged a total credit outlay of Rs 19247.93 lakhs against which the achievement was Rs 23509.19 lakhs.

Table-5.29
Annual Credit Plans Targets & Achievments

Year	Targets	Achievements	Percentage achievements
2004-05	13239.02	14450.19	109.15
2005-06	15280.98	17701.20	115.84
2006-07	19247.93	23509.19	122.14

Source: Annual Credit Annual Plan Una, 2007-08

Table-5.30
Sector wise performance of Banks during 2006-07 (Rs. Lakhs)

Sr. No.	Particular	Agriculture	SSI	OPS	Total
1	Commercial Banks	40.6	25.8	33.6	15277.26 (100)
2	Kangra Cooperative Bank	38.9	9.8	51.3	3482.20 (100)
3	Land Development Bank	70.1	3.8	26.1	315.91 (100)
4	Himachal Gramin Bank (RRB)	27.7	5.1	67.2	303.42 (100)
	Total	**40.5**	**22.3**	**37.2**	**19378.79 (100)**

Source: Annual Credit Annual Plan Una, 2007-08

Table-5.31
Block wise distribution of credit as per Annual Credit Plan - 2007-08 (in %age)

Block	Agriculture		Agri__		NFS		OPS		Total	
	No. of ACs	Amount	No. of ACs	Amount	No. of ACs	Amount	No. of ACs	Amount	No. of ACs	Amount
Amb	1667	18.7	682	20.1	247	10.1	1191	17.3	3787	16.7
Bangana	2401	13.6	435	13.6	181	2.6	473	11.4	3590	10.7
Gagret	551	12.6	217	14.5	123	20.4	539	17.2	1430	16.1
Una	2371	31.8	742	34.4	612	52.5	1559	43.3	5290	40.6
Haroli	1661	23.2	366	17.4	209	14.4	409	10.7	2646	15.9
Total	8741	100	2442	100	1372	100	4171	100	16733	100
		685729 (Lakhs) (33.5)		99533 (Lakhs) (4.9)		355300 (Lakhs) (17.3)		907800 (Lakhs) (44.3)		2048362 (Lakhs) (100)

Source: Annual Credit Annual Plan Una, 2007-08

Table-5.32
Sectorwise Distribution of Credit in Different Blocks of Una (Rs '000)

Block	Amb		Bangana		Gagret		Una		Haroli		District	
	No. of ACs	Amount	No. of ACs	Amount	No. of ACs	Amount	No. of ACs	Amount	No. of ACs	Amount	No. of ACs	Amount (Lakh)
Crop Loan	1232	100131	2143	76134	360	68640	1638	167900	1370	142048	6761	554853 (27.1)
Minor Irrigation	43	1810	42	1040	16	910	70	3088	40	3848	211	10696 (0.5)
Land Development	60	3880	49	2367	13	817	64	558113	59	3491	245	16076 (0.8)
Farm Machinery	70	10580	24	4442	50	6429	81	289	36	4622	261	39362 (1.9)
Plantation & Horticulture	34	1481	23	1905	28	2787	66	4803	24	549	175	11525 (0.6)
Other Agri allied	228	10337	210	7682	75	6991	452	23495	123	4710	1088	53217 (2.6)
Sub-Total Agri	**1667**	**128221 (37.6)**	**2491**	**93570 (42.5)**	**551**	**86574 (26.3)**	**2371**	**218156 (26.2)**	**1661**	**159208 (49.0)**	**8741**	**685729 (33.5)**
Dairy Development	5887	16230	283	9160	144	9433	501	19482	270	13125	1785	67430 (3.3)

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Poultry	9	175	16	350	13	600	31	2210	14	350	83	3685 (0.2)
Sheep/Goat/ Piggery	12	174	22	394	10	135	32	229	8	164	84	1096 (0.05)
Fishery	8	163	23	720	14	617	21	1235	3	257	69	2992 (0.15)
Forestry	31	1263	57	1637	16	1136	93	2965	36	1247	233	8248 (0.4)
Storage, Godown, Market Yards	35	20025	435	13591	217	14447	742	34213	366	17257	2442	99533 (4.9)
Sub total	**682**	**20025 (5.8)**	**435**	**13591 (6.2)**	**217**	**14447 (4.4)**	**742**	**34213 (4.1)**	**366**	**17257 (5.3)**	**2442**	**99533 (4.9)**
Non-farm sectors	247	35772 (10.5)	181	9200 (4.2)	123	72500 (22.0)	612	186840 (22.4)	209	50988 (15.7)	1372	355300 (17.3)
Other Priority Sector	1191	157271 (46.1)	473	103710 (47.1)	539	156230 (47.3)	1559	393087 (47.2)	409	97502 (30.0)	4171	907800 (44.3)
Sub-Total	**1372**	**193043**	**654**	**112910**	**662**	**228730**	**2171**	**579927**	**618**	**148490**	**5543**	**1263100**
Total	**3787**	**341289 (100)**	**3580**	**220071 (100)**	**1430**	**329751**	**5290**	**832296**	**2646**	**324955**	**6733**	**2048362 (100)**

Source: District Credit Plan, 2007-08 Una

The sub-sector wise credit disbursements show that out of total credit disbursement, almost 27 per cent is provided as crop loan. The dairy, which is an important sub-sector, is getting only 3 per cent. Fishery and poultry are getting less than half per cent each. Land development and farm machinery, which are important for bringing more area under agricultural crops and also increase in productivity, are getting 0.8 and 1.9 percent respectively. Even for the sub-sector of animal husbandry i.e. sheep, goat and piggery rearing which has a greater scope in the district and for the other sub-sectors like minor irrigation, plantation and horticulture, the disbursement is not sufficient. There is a strong case for increasing credit disbursement for these sub sectors.

In the total credit disbursement to agriculture and allied sectors, the percent share of commercial banks, Kangra co-operative bank, the state agricultural development banks and rural regional banks is 78.7, 17.2, 2.8 and 1.1 respectively. This shows that the agricultural credit is mainly made available by the commercial and central cooperative banks. The share of state agricultural development banks and rural regional banks is negligible. In fact the share of commercial banks is continuously on the rise since the introduction of Kisan Credit Card Scheme.

There is a strong case for increasing credit facility to agriculture and allied sectors, but at the same time, the banks and cooperatives should ensure that this facility is not misused by the farmers and others. It has been reported that crop loan, and other loans taken for the purchase of dairy animals and agricultural machinery, are sometimes, misused by the farmers. Such misuse of credit facility not only negates the very purpose of credit facility

but also push the farmers into debt traps. Thus the credit disbursing institutions should find ways to check this menace of credit misuse.

It was also observed that a significiant percentage of farming households is under debt, though, it is not as much as in Punjab, but the main reasons of the indebtedness are;

- Higher price of farm inputs;
- Higher rates of interest by banks & commission agents;
- Fluctuating prices of farm produce;
- Low profit margins due to stagnation in crop yield;
- Crop failure or fluctuation in yield;
- Exploitation by commission agents;
- Higher expenditure on social ceremonies;
- Laziness and lack of hard work;
- Increasing expenditure on health care and education;
- Increasing expenditure on alcohol and intoxicants;
- Complicated and time consuming procedure to get institutional credit; and
- Absence of sub-sidary/allied activities among majority farming households.

5.13 Special Projects/Programmes Ongoing in the district

The following special projects/programmes relating to horticulture, animal husbandry and other allied sectors are on-going in the district:

Department/Scheme	Sponsoring Agency
Horticulture	
Horticulture Technology Mission/National Horticulture Mission	GOI
Development of Horticulture (Fruits and Vegetables) Under Scheduled Caste Sub Plan	State Government
Development of Horticulture (Fruits and Vegetables) Under Scheduled Tribe Plan	State Government
Development of Horticulture (Fruits and Vegetables) Under Backward Area Sub Plan	State Government
Animal Husbandry	
Special Livestock Breeding Programme (SLBP)	
Backyard Poultry Scheme	
Fisheries	
Community Ponds Development Scheme	State Government
Development of Village Ponds	
Fish Cart Scheme	GOI
Fish Farming Development Agency (FFDA)	
Carp Farm Developments for ST beneficiaries	State Government
Cat Fish Culture at Panjawar	
Cat Fish (Magur) Culture trial project under ATMA in Swan Area	
Fresh Water Pearl Culture	
Development of Waste lands and Watershed Development Programme	
Haryali	GOI

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Integrated Watershed Management Project in Una District (Swan River Project).	Government of Japan
Forestry	
Forest Development Agency (FDA)	GOI
National Bamboo Mission	GOI
Integrated Forest Protection Scheme	GOI
2402-Plan	State Government
2406-Plan	State Government
4406-Plan (Capital Section)	State Government
Jatropha Project	
Swan Project	
Lantana Eradication and its Management through Participatory Approach	

5.14 Constraint Analysis

(a) Productivity gap analysis of major crops and animal products and reasons for gaps

It has been noticed that there are marked gaps in the productivity potential and actual production of different fruit and vegetable crops and animal products in the district. There are various reasons for that. The analysis of these productivity gaps and the reasons for that is provided below:

Productivity Gaps in Major Fruits

Mango, Kinnow, lemon, pears and litchi are the main fruits of district Una. It has been observed that productivity of orchards of these fruits is much less than their real potential. However the gap in productivity varies from orchard to orchard. This gap largely depends on the magnitude of gap between the recommended practices and the actual practices followed by the farmers. There is a linear correlation between the two, that is, greater the gap between actual and recommended practices, greater is the productivity gap and vice-versa. Studies by ATMA team Una revealed that against the recommended dose of 40kg/plant of Farm Yard Manure (FYM) farmers are applying only 5-10 kg/plant. Major and minor plant nutrients are not applied at all. Farmers are also not following recommended practices in case of distance between plants, pest and disease management, number of irrigations etc. in many cases they are also not using quality planting material. As a result productivity of most orchards is much lower than their potential.

Productivity Gaps in Major Vegetables

Potato and cucurbits are the main vegetables of this district. Potato accounts for about 60 % of the total are under vegetables. Whereas productivity gaps in potato are generally low, it is quite wide in case of cucurbits. In case of potato, against the expected yield of 250-300 q/ha, the actual production is around 250 q/ha. But in case cucurbit against the expected yield of 300-350 q/ha the actual production in AES I and III it is between 200-250 q/ha, in AES-II between 175-200 q/ha and in AES-IV it is only 150 q/ha. Narrow gap in the productivity of potato is largely due to the fact that the gap in the recommended and

actual practices is also narrow. There is no gap in the time of sowing, method of sowing, varieties sown, weed management, method of irrigation and method of harvesting. With regard to other recommendations most gaps are partial. There are only few recommendations where gap is full. The comparatively wider gap in case of cucurbits is that local seed is used in case of cucumber, fertilizer quantity used is almost half the recommended quantity. There is a full gap in case of insect and disease management as well as in case of seed treatment.

Productivity Gaps in Milch Animals

Buffalo and cow are the main milk providing animals in the district. The average yield of both these animals is about 50 % of the expected yield. Against the expected average daily milk yield of 10 lt. per cow, the actual productivity is only 5 lt. Likewise the actual milk yield of buffaloes is 3-6 lt/day against the expected yield of 8-10 lt./day. The main reasons for this gap are:

- **Poor bread of the animals:** Most buffaloes and cows are of non-descript local breeds. The number of CB. cows is very small. The yield of CB cows is also low.
- **Nutritional Deficiency:** The feed which is provided to the animals is less in quantity and poor in quality. Thus the animals suffer from low input/output syndrome.
- **Poor health management of animals:** De-worming of animals is not done regularly. They also suffer from other diseases.
- **Poor management techniques:** Farmers are not fully aware of the modern methods of management of milch animals.

Productivity Gaps in Wool and Meat Providing Animals

Sheep and goat are the wool and meat providing animals in the district. The productivity level of these animals is low. The main reasons for their low productivity are:

Poor breed of the animals: Sheep and goat in the district are of local breeds which have low productivity in terms of wool and meat.

Nutritional deficiency: Sheep and goat are grazing animals. Stall feeding of these animals is not done. Neither they are provided any supplements to meet the nutritional deficiency. The pastures and grazing grounds in the district are of poor quality.

Poor Health Care: The health care programmes and health care infrastructure for these animals in the district are also poor.

(b) Research/Extension/Adoption Gaps

The specific research/extension/adoption gaps in selected fruits and vegetables and in milch animals identified by ATMA, team Una in different AESs of Una district have been provided below for the convenience of readers of this report.

Table-5.33
Recommended V/s Farmers' Practices for Mango & Litchi in the Representative Villages under each AES

Items of Package	Recommended Package	Practices Followed by the Farmers			
		AES-I	AES-II	AES-III	AES-IV
Variety	Graded/Budded	Graded/Budded	Graded/Budded	Graded/Budded	Graded/Budded
Spacing (m)	As per Horticulture package and Practices (10X10)	Approx./guess method	Approx./guess method	Approx./guess method	Approx./guess method
Farm Yard Manure (kg/plant)	40 Kg	5-10 Kg	5-10 Kg	5-10 Kg	5-10 Kg
Major Nutrients (N+P+K)					
Dose (kg/plant)	1 kg/year	-	-	-	-
Method of Application	Soil Application	-	-	-	-
Minor Nutrients					
Dose (kg/plant)	As per soil test value	-	-	-	-
Method of Application	Soil Application; Foliar spray	-	-	-	-
Weed Management					
Around the plants	Weedicides; Plastic Mulching	Hand Weeding	Hand Weeding	Hand Weeding	Hand Weeding
In between the rows					
Insect Management	Use of Insecticides	Recommend shedulr is not followed	Recommend shedulr is not followed	Recommend shedulr is not followed	Recommend shedulr is not followed
Disease Management	Use of Fungicides	-do-	-do-	-do-	-do-
Water Management					
- No. of Irrigations	3	1	1	1	1
- Methods of Irrigation	Drip/Sprinkler method	Flood Irrigation	Flood Irrigation	Flood Irrigation	Flood Irrigation

Source: ATMA Report, Una District

Table-5.34
Adoption Gap in the Cultivation Practices for Mango & Litchi in the Representative Villages under Each AES

S.No.	Agronomic Practices	AES-I	AES-II	AES-III	AES-IV
		Mango & Litchi	Mango & Litchi	Mango & Litchi	Mango & Litchi
1	Variety	N	N	N	N
2	Spacing	P	P	P	P
3	Farm Yard Manure	P	P	P	P
4	Major Nutrients				
	Dose	F	F	F	F
	Method of Application	F	F	F	F
5	Minor Nutrients				
	Dose	F	F	F	F
	Method of Application	F	F	F	F
6	Weed Management				
	Around Plant	P	P	P	P
	In between rows	-	-	-	-
7	Insect management	P	P	P	P
8	Disease Management	P	P	P	P
9	Water Management				
	No. of Irrigations	P	P	P	P
	Methods	P	P	P	P

Source: ATMA Report, Una District

Table-5.35
Recommended V/s Farmers' Practices for Kinnow, Santra and K-Lime in the Representative Villages under each AES

Items of Package	Recommended Package	Practices Followed by the Farmers			
		AES-I	AES-II	AES-III	AES-IV
Variety	Graded/Budded	Local	Local	Local	Local
Spacing (m)	(5 X 5)	A usual or narrow spacing	A usual or narrow spacing	A usual or narrow spacing	A usual or narrow spacing
Farm Yard Manure (kg/plant)	40 Kg	5- 10 Kg	5- 10 Kg	5- 10 Kg	5- 10 Kg
Major Nutrients (N+P+K)					
Dose (kg/plant)	1 kg/year	-	-	-	-
Method of Application	Soil Application	-	-	-	-
Minor Nutrients					
Dose (kg/plant)	As per soil test value	-	-	-	-
Method of Application	Soil Application; Foliar spray	-	-	-	-
Weed Management					
Around the plants	Weedicides; Plastic Mulching	Hand Weeding	Hand Weeding	Hand Weeding	Hand Weeding
In between the rows					
Insect Management	Use of Insecticides	Recommend shedul is not followed	Recommend shedulr is not followed	Recommend shedulr is not followed	Recommend shedulr is not followed
Disease Management	Use of Fungicides	-do-	-do-	-do-	-do-
Water Management					
- No. of Irrigations	3	1	1	1	1
- Methods of Irrigation	Drip/Sprinkler method	Flood Irrigation	Flood Irrigation	Flood Irrigation	Flood Irrigation

Source: ATMA Report, Una district

Table-5.36
Adoption Gap in the Cultivation Practices for Kinnow & Santra in the Representative Villages Under Each AES

S.No.	Agronomic Practices	AES-I	AES-II	AES-III	AES-IV
		Kinnow & Santra	Kinnow & Santra	Kinnow & Santra	Kinnow & Santra
1	Variety	P	P	P	P
2	Spacing	F	F	P	P
3	Farm Yard Manure	P	P	P	P
4	Major Nutrients				
	Dose	F	F	F	F
	Method of Application	F	F	F	F
5	Minor Nutrients				
	Dose	F	F	F	F
	Method of Application	F	F	F	F
6	Weed Management				
	Around Plant	P	P	P	P
	In between rows	-	-	-	-
7	Insect management	P	P	P	P
8	Disease Management	P	P	P	P
9	Water Management				
	No. of Irrigations	P	P	P	P
	Methods	P	P	P	P

Source: ATMA Report, Una district

Table-5.37
Recommended V/s Farmers' Practices for Potato in the Representative Villages under each AES

Sr. No.	Agronomic Practice	Recommendations	Practice followed by the farmers	
			AES-I	AES-II
1.	**Sowing**			
	- Timing	Sept- Jan	Sept-Jan	Sept-Jan
	- Method	Ridges	Ridges	Ridges
2.	**Varieties**	KCM, KJ, KB, KP	KCM, KJ	KCM, KJ
3.	**Seed Rate 9per/ha)**	20-25 Qtls/ha	20-25 Qtls/ha	20-25 Qtls/ha
4.	**Seed Treatment**	Dithane M-45 1.5 g + Bevistin 1.6 1 g/L of water	Nil	Nil
5.	**Fertilizers/Nutrients (kg/ha)**			
	- Basal (N+P+K)	60:80:60	40:40:40	40:40:40
	- Top Dress	60Kg. N/ha	60 kg N/ha	60 kg N/ha
6.	**Method of fertilizers**			
	- Basal	Line Method	Broadcast	Broadcast
	- Top Dress	Line Method	Broadcast	Broadcast
7.	**NPK**	Package available	Not followed properly	Not followed properly
8.	**Micro-nutrients**			
	- Dose (kg/ha)	Recommended by	Nil	Nil
	- Method of Application	the KVK/SAU		
9.	**Pest management**	Choloropyriphos @ 21/ha	Phorate-granules	Phorate-granules
10.	**Disease Management**	Dithane M-45 1.5g	Nil	Nil
		Bevistin 1g/L of water		
11.	**Weed Management**			
	- Mechanical	Manual	Manual	Manual
	- Herbicides	Paraquate @ 1.5 1/ha	Nil	Nil
12.	**IPM**			
13.	**Water Management**			
	- No. of irrigations	4-6 irrigations	2-3 Irrigation	2-3 Irrigation
	- Methods	Flood Irrigation	Flooding	Flooding
14.	**Method of Harvesting**	Manual	Manual	Manual
15.	**Value addition during the crop growth**	De-helming of potato crop during late tuberisation so as to have desired size and skin tubers suitable for market	Prevalent	Prevalent
16.	**Average Yield**	250-300 q/ha	250 kg/ha	250 kg/ha

Source: ATMA Report, Una

Table-5.38

Adoption Gap in the Cultivation Practices for Potato in the Representative Villages under Each AES

Sr. No.	Items in Packages	AES-I	AES-II
1	Sowing		
	Timing	N	N
	Method	N	N
2	Varieties	P	P
3	Seed rate	N	N
4	Seed Treatment	F	F
5	Fertilizers/Nutrients (kg/ha)	P	P
6	Method of fertilizer application	F	F
7	INM	P	P
8	Micro-nutrient	F	F
9	Pest Management	P	P
10	Disease management	F	F
11	Weed management		
	Mechanical	N	N
	Herbicides	F	F
12	IPM	F	F
13	Water management		
	No. of Irrigations	P	P
	Flood Irrigation	N	N
14	Method of harvesting	N	N
15	Average Yield	P	P

Source: ATMA Report, Una

Table-5.39

Recommended V/s Farmers' Practices for Cucurbits in the Representative Villages under each AES

Sr. No.	Agronomic Practice	Recommendations	Practice followed by the farmers			
			AES-I	AES-II	AES-III	AES-IV
1	**Sowing**					
	- Timing	Feb-Mar & Jun-July	Feb-Mar & Jun-July	Feb-Mar & Jun-July	Feb-Mar & Jun-July	Feb-Mar & Jun-July
	- Method	Line Sowing	Line Sowing	Line Sowing	Line Sowing	Line Sowing
2	**Varieties**					
	Cucumber	Pionset Japaneese Long Malini	Local	Local	Local	Local
	Bottle guard	Meghdoot, Punjab round	Punjab round	Punjab round	Punjab round	Local
3	**Seed Rate (per ha)**					
	Cucumber	3-4 kg/ha	2.2-3 kg/ha	3-4 kg/ha	3-4 kg/ha	2-3 kg/ha
	Bottle Guard	5-6 kg/ha	3.4 kg/ha	5-6 kg/ha	5-6 kg/ha	3 kg/ha
3	**Seed Treatment**	Bevistin 2-3h/kg of seeds	Nil	Nil	Nil	
5	**Fertilizers/Nutrients (kg/ha)**					
6	- Basal (N+P+K)	50:50:60	25:25:40	30:30:60	30:20:20	25:25:40
	- Top Dress	50 kg N/ha	30 kg/ha	40 kg/ha	30 kg/ha	50kg/ha
	Insect management	Malathian @ 2 ml/L of water Endosulphan @ 2 ml/L of water	Not followed properly Nil	Nil	Nil	Nil
8	**Disease Management**	Dithane M- 45	Nil	Nil	Nil	Nil
		Sulfax, Ridomil	Nil			
10	**Water Management**					
	- No. of irrigations	4-6 irrigations	3-4 irrigations	3-4 irrigations	4-6 irrigations	3-4 irrigations
	- Methods	Flood Irrigation	Flooding	Flooding	Flooding	Flooding
12	**Average Yield**					
	-Grains	300-350 q/ha	200-250 q/ha	175-200 q/ha	200-250 q/ha	150 q/ha
	- Fodder	350-400 q/ha	200-225 q/ha	200 q/ha	225-260 q/ha	160 q/ha

Source: ATMA Report, Una District

Table-5.40
Adoption Gap in the Cultivation Practices for Cucurbits in the Representative Villages under Each AES

Sr No.	Items in Packages	AES-I	AES-II	AES-III	AES-IV
1	Sowing				
	Timing	N	N	N	N
2	Varieties	N	N	N	N
3	Seed rate	P	N	N	P
4	Seed treatment	F	F	F	F
5	Fertilizers/Nutrients	P	P	P	P
	Basal				
	Top Dress				
6	Micro Nutrient	F	F	F	F
7	Insect management	F	F	F	F
8	Disease Management	F	F	F	P
9	Water Management				
	No. of Irrigations	P	P	-	-
	Method	N	N	N	N
10	Average Yield	P	P	P	P

Source: ATMA Report, Una District

Table-5.41
Recommended V/s Farmers' Practices for Cows in the Representative Villages under each AES

Sr. No.	Items of Package	Recommended Existing Practices				
		Practice	AES-I	AES-II	AES-III	AES-IV
1.	Breed upgradation					
	Artificial Insemination	Artificial Insemination at Al centre	70% Artificial Insemination and 30% by natural services	70% Artificial Insemination and 30% by natural services	70% Artificial Insemination and 30% by natural services	70% Artificial Insemination and 30% by natural services
	Natural Service					
2.	Feed Management					
	- green fodder kg/day	20-25 kg/day	20 kg/day	20 kg/day	20 kg/day	20 kg/day
	Dry fodder kg/day	5-7 kg/day	4-5 kg/day	4-5 kg/day	4-5 kg/day	4-5 kg/day
	Concentrates kg/day	2 kg+ 1 kg/ 2 ltr of milk	Nil	Nil	Nil	Nil
	Minerals and Vitamins g/day	30-40 g/day	Nil	Nil	Nil	Nil
3.	Inter Calving period	12 months	24 months	24 months	24 months	24 months
4.	Health Care (Per Year) Vaccination					
	- HSBQ	Annual	Annual	Annual	Annual	Annual
	- FMD	2 times a year	2 times a year	2 times a year	2 times a year	2 times a year
	- RP	-	-	-	-	-
	- Mastitis	-	-	-	-	-
	- Theileriasis	-	-	-	-	-
5.	General Management					
	- Washing/Cleaning	Twice a day depend upon the season	Once a day	Once a day	Once a day	Once a day
	- Housing (Pucca/Kacha)	Pucca	Kucha	Kucha	Kucha	Kucha
	- Drinking Water	40-50 Lt/ Ad lib	Ad lib	Ad lib	Ad lib	Ad lib
6.	Average Milk Yield (Ltr/day)	10 Lt/day	5 Lt/day	5 Lt/day	5 Lt/day	5 Lt/day

Source: ATMA Report, Una district

Table-5.42
Adoption Gap in the Cultivation Practices for Cows in the Representative Villages under Each AES

S.No.	Agronomic Practices	AES-I	AES-II	AES-III	AES-IV
		Cows	Cows	Cows	Cows
1	Breed upgradation	P	P	P	P
	Artificial Insemination				
	Natural Service				
2	Feed Management				
	Green Fodder	P	P	F	P
	Dry Fodder	P	P	P	P
	Concentrate	P	F	F	-
	Mineral & Vitamins	F	F	F	F
3	Inter Calving Period	P	P	P	P
4	Health Care (per year) Vaccination				
	HSBQ	-	-	-	-
	FMP	-	-	-	-
	RP	-	-	-	-
	Mastitis	-	-	-	-
	Theileriasis	-	-	-	-
5	General Management				
	Washing/Cleaning	P	P	P	P
	Housing	F	F	F	F
	Drinking Water	N	N	N	N
6	Average Milk Yield (ltr/day)	P	P	P	P

Source: ATMA Report, Una district

Table-5.43
Recommended V/s Farmers' Practices for Buffaloes in the Representative Villages under each AES

Items of Package	Recommended Existing Practices				
		AES-I	AES-II	AES-III	AES-IV
Breed upgradation					
Artificial Insemination	Artificial Insemination	Both AI and natural service by local buffalo bull	Both AI and natural service by local buffalo bull	Both AI and natural service by local buffalo bull	Both AI and natural service by local buffalo bull
Natural Service	Natural Service by improved buffalo bulls				
Feed Management					
- green fodder kg/day	22-25 kg/day				
Dry fodder kg/day	5-8 kg/day	10 kg/day	10 kg/day	8-10 kg/day	10-12 kg/day
Concentrates kg/day	2 kg+ 1 kg/ 2 ltr of milk	5 kg/day	8-9 kg/day	4-6 kg/day	4-5 kg/day
Minerals and Vitamins g/day	30-40 g/day	Nil	Nil	Nil	Nil
Inter Calving period	14-16 months	20-24 month	24-28 month	26-28 month	26-28 month
Health Care (Per Year) Vaccination					
- HSBQ	Annual	Annual	Annual	Annual	Annual
- FMD	2 times a year	2 times a year	2 times a year	2 times a year	2 times a year
- RP	-	-	-	-	-
- Mastitis	-	-	-	-	-
- Theileriasis	-	-	-	-	-
General Management					
- Washing/Cleaning	Twice a day depend upon the season	Once a day	Once a day	Once a day	Once a day
- Housing (Pucca/Kacha)	Pucca	Kucha	Kucha	Kucha	Kucha
- Drinking Water	50-65 Lt/ Ad lib	Ad lib*	Ad lib*	40-50	40-50
Average Milk Yield (Ltr/day)	8-10 Lt/day	3-6 Lt/day	3-5 Lt/day	5-6 Lt/day	4-6 Lt/day

Source: ATMA Report, Una district
Note: *- Up to full utility/Capacity

Table-5.44
Adoption Gap in the Cultivation Practices for Buffaloes in the Representative Villages under Each AES

S. No.	Agronomic Practices	AES-I	AES-II	AES-III	AES-IV
		Buffaloes	Buffaloes	Buffaloes	Buffaloes
1	Breed upgradation	P	P	P	P
	Artificial Insemination				
	Natural Service				
2	Feed Management				
	Green Fodder	P	P	P	P
	Dry Fodder	P	N	P	P
	Concentrate	P	F	F	P
	Mineral & Vitamins	F	F	F	F
3	Inter Calving Period	P	F	F	F
4	Health Care (per year) Vaccination				
	HSBQ	-	-	-	-
	FMP	-	-	-	-
	RP	-	-	-	-
	Mastitis	-	-	-	-
	Theileriasis	-	-	-	-
5	General Management				
	Washing/Cleaning	P	P	P	P
	Housing	P	F	F	F
	Drinking Water	-	-	N	P
6	Average Milk Yield (ltr/day)	P	P	P	P

Source: ATMA Report, Una district

(c) Processing/Storage/Marketing Gaps

The district has just a few food processing industries. These units are located at Amb, Una and Bangana. They make use of tomato, vegetables, mango, apple and citrus to produce jam, pickles, juices etc. There is only one reasonably large unit which had a turnover of Rs 889.30 lakh in 2002-03. Other units are too small with a turnover of between 5.00 lakh to 13.50 lakh in 2002-03. These units use low grade technology.

The district lacks cold storage facility to store fruit, potato and other vegetables. Marketing facilities for fruit and vegetables in the district are inadequate. These facilities are available only at Una and Santoshgarh.

Farmers generally have to go to different markets in Punjab, especially at Hoshiarpur. The Vegetable markets at Una and Santoshgarh also require upgradation of facilities and infrastructure.

(d) Existing Institutional Mechanism in the Government Sectors

The development programmes of the various allied agricultural sectors are monitored by a number of Government Departments. The brief outline of administrative setup, functions, manpower and available infrastructure of each of these departments is provided below:

Department of Horticulture

The department of horticulture in Una district is working under the aegis of Director Horticulture, Government of Himachal Pradesh. At the district level, the department is

being operated under the overall leadership of Deputy Director, Horticulture with a team of 65 members. The total sanctioned posts in the department are 65, out of which 11 are vacant. Most of the vacant posts are of horticulture extension officers, who are the most important functionnaries of the department as their main responsibility is to develop horticulture at the field level.

Department of Animal Husbandry

In order to cater management needs, health cover of livestock and control of diseases that inflict livestock directly or indirectly, the department of Animal Husbandry is operating through a network of 129 Veterinary Institutions that include 18 Veterinary Hospitals, 1 Central Veterinary Dispensary, 1 Mobile Veterinary Dispensary, 4 Veterinary Check Posts, 104 Veterinary Dispensaries and 1 Government Poultry Farm. The location of these institutions is scattered through out the district for providing prompt services to the livestock and livestock breeders. The manpower in these institutions is in the form of 2 Senior Veterinary Officers, 19 Veterinary Officers, 2 Chief Veterinary Pharmacists, 16 Animal Husbandry Assistants and 130 Veterinary Pharmacists, to provide best services for the betterment of livestock in Una District.

Department of Fisheries

The department of fisheries is overseen by Director-cum-Warden fisheries at the state level. The administrative structure of the fisheries department from the district to village levels is served by Assistant Director, Senior Fisheries Officer, fisheries officers and field assistants. Total sanctioned posts in the department of fisheries in Una district are 8, out of which one post is vacant.

Department of Forest

The forest department in the district is working under the overall supervision of principal chief conservator of Forests, Shimla. The district office is located in Una. Against 230 sanctioned posts in the department, the existing number of posts is 257 (31 temporary forest workers have been regularized in 2007).

Agricultural Credit Facility

Una district has 374 Primary Cooperative Societies, [219 are Primary Agricultural Cooperative Societies (PACSs)], 53 branches of Commercial banks, 22 of Co-operative banks, 4 of Land Development Banks, 3 of Regional Rural banks and one branch of Private bank (ICICI), catering the needs of both agriculture and non-agriculture sectors.

Others

The efforts of the various Government Departments to promote allied agricultural sector are also supplemented by the Krishi Vigyan Kendra.

Income Analysis of Various Categories of Farmers

Income analysis of various categories of farmers has been provided already in Chapter-IV, Section-4.9.

5.15 Recommended Interventions for the District

To promote the allied agricultural sectors, the recommended interventions along with the action plan and costing for each sector are provided below:

(a) Horticulture : Fruit Cultivation

To promote fruit cultivation in the district the following interventions along with the strategies for action plan are suggested:

Intervention: Bring more area under fruit cultivation.

Target: About 300 ha per year.

Location:-

- Give preference to areas where cultivation of fruit is already quite popular, that is, valley section of the district (see map – 5.1)
- Explore the possibility of extending fruit cultivation to areas where fruit cultivation is not popular, such as the hilly areas of the district
- Some areas out of the cultivable waste lands and other waste lands which are likely to be brought under cultivation in the command areas of check dams and along river Swan after channelisation be earmarked for fruit cultivation.
- Setup Mango Estates and Kinnow Estates in the district.

Strategies: - To bring more area under fruit cultivation the Horticulture Department should do the following:

- Create awareness among farmers about the economics of fruit cultivation vis-à-vis cultivation of wheat, maize or other crops.
- Provide guidance in the selection of fruit type and its appropriate variety in accordance with the geographical location of the proposed plantations.
- Supply disease free quality planting material to the farmers.
- Provide technical guidance for the pre-planting and planting operations.
- Monitor the growth of plants for the first three years.
- Provide financial assistance and other incentives as per departmental norms for plantation of new orchards.
- Promote setting up of fruit plant nurseries in the private sector. Provide financial assistance as per department norms and conditions.
- Promote drip/sprinkler system of irrigation in new orchards. Subsidy as per departmental norms be provided for that purpose.

- Provide additional incentives for the plantation of Kinnow and Desi as well as grafted varieties of Mangoes.

Intervention: Improve productivity of existing orchards.

Target: Achieve 8-10% increase in the productivity of existing orchards annually.

Strategies:-

- Reduce gaps in the recommended and existing practices with regard to use of manure, chemical fertilizers, soil micro- nutrients, and pest and disease control.
- Guide farmers to use the recommended doses of FYM/Compost/Vermi Compost, N.P.K. and micro-nutrients. Popularize IPM technique to control the pests, and diseases.
- Control fruit fall. Find reasons for fruit fall and use appropriate measures to control it.
- Rejuvenate old orchards. Provide training to farmers in the techniques of rejuvenation of old trees. Provide the required P.P. Chemicals on subsidized rates on the pattern of NHM for the said purpose. Cover about 100 ha per year.
- Horticulture Department should prepare directory of fruit growers, preferably on computer, at the block level with complete information about the farmer and his fruit trees. The extension services be provided by the department on phone. Let the department inform each farmer from time to time the various operations which the farmers should perform to get higher productivity. Use of new technology be made to send the alert calls.

Intervention: Introduce new fruits in the area.

Present Status: Although a large variety of fruits are cultivated in the district, mango and citruses account for 66 % of the total area under fruits. Pears also account for a fairly large area (15 %). Other fruits together account for the remaining 19 % of the area.

Strategies:-

- Explore the possibility of expanding cultivation of banana in the valley area and kiwi in hill areas.

Intervention: Reduce post-harvest losses.

Present Status: It has been estimated that 20-30% losses in fruit and vegetables take place in the post harvest stage. Early or late plucking of fruit, wrong technique of plucking, improper handling of fruit at the time of grading, packing, transportation storage etc can damage the fruit resulting in considerable loss to the farmers.

Strategies:-

- Organize training and awareness camps of farmers for proper handling of fruit at various stages.
- Create cold storage facility for safe storage of fruit.

Intervention: Promote value addition.

Strategies:-

- Promote fruit processing and canning industry in the district.

Intervention: Promote research and extension activities.

Strategies:-

- Provide adequate funds to Horticulture University, Solan and KVK Una for research and extension work in the field of horticulture. The specific problems on which these institutes should focus on are:
- Identification of specific fruits and their varieties which can be successfully cultivated in different parts of the district. Cultivars of banana and kiwi fruit be tested for introduction in the area.
- Improving horticultural practices for higher productivity. In this context high density cultivation of certain fruits be thoroughly examined.
- Find biological or bio-pesticide solution to control the common pests of fruit trees.

Intervention: Improve fruit marketing.

Strategies:-

- Develop modern agricultural market at Una and mini agricultural markets at the block level.
- Improve road transport network within the district to market fruit in remote areas of the district.
- Motivate farmers to form fruit marketing cooperative to market the fruit in distant markets like Chandigarh, Delhi etc.

(b) Animal Husbandry

The following interventions are recommended for the development of Animal Husbandry Sector.

Intervention: Promote dairy farming in the district.

Strategies:-

- Replace low quality milch animals of local breeds by superior quality milch animals like cross breed cows and Murrah and Neli Bar breeds of buffalo from outside the district.

- Promote genetic upgradation of milch animals through cross breeding programmes.
- Improve the quality and quantity of feed and fodder of milch animals for enhancement of their productivity.
- Enhance the availability of green fodder and good quality feed in the district.
- Deworming and eradication of milch animals from external parasites must be done regularly.
- Promote single cow dairy units and rearing of cross breed female calves among small and marginal farmers.
- Promote commercial dairy farming with herd size of 10 or more milch animals by providing adequate incentives.
- Promote clean milk production. For that educate the milk producers and milk handlers to maintain proper sanitation and hygiene, and provide Bulk Milk Cooler to Milk Cooperatives on subsidized rates for cooling the milk immediately after milking the animals.
- Establish mini Milk Plants at the block level and even at large sized villages.
- Strengthen milk collection and marketing network.

Intervention: Improve animal health services in the district.

Strategies:-

- All animals should be regularly vaccinated against foot and mouth, and other communicable diseases.
- Strengthen the infrastructure and services at the veterinary dispensaries in the district.

Intervention: Improve/upgrade breeding programmes.

Strategies:-

- Promote genetic upgradation in cow and buffalo through cross-breeding and of buffalo, sheep and goat through selective breeding.
- Promote artificial insemination in cow and buffalo for genetic upgradation.

Intervention: Improve the availability of feed and fodder for the animals on the departmental farms.

Strategies:-

- Establish departmental cattle feed manufacturing unit**.**
- Promote cultivation of HYV of fodder in the district.
- Improve pastures and grazing lands

Intervention: Promote poultry farming in the district.

Strategies:-

- Promote broiler units with 5000 birds each to ensure supply of quality meat in the district.
- Promote layer units with 5000 birds each to ensure the supply of eggs and enhance the availability of chicken meat.
- Promote back yard poultry units to mitigate nutritional deficiency of BPL families.

(c) Fisheries

Intervention: Promote fisheries in the district.

Strategies:-

- Strengthen departmental fish farm and hatcheries.
- Create awareness among farmers about the economic benefits of fish farming.
- Organize training programmes in fish culture and provide stipend to the trainees.
- Provide liberal incentives for setting up fish farming units.
- The water logged areas, village ponds, checkdams and reservoirs be used for fish farming.

(d) Watershed Development

Intervention: Carry out integrated development in micro areas on watershed basis.

Strategies:-

- Carryout water harvesting, soil conservation and tree plantation in an integrated manner in the watersheds of tributories of Soan river.
- Take up pasture development programmes under this scheme.
- Take up reclamation of culturable waste lands under this scheme.

Social Forestry

Intervention: Bring more area under tree plantation to meet the requirement of timber, fuel wood and forage.

Strategies:-

- Promote plantation on community lands as well as private lands through Village Forest Committees.
- Organise Village Forest Committees in maximum number of villages
- Plant at least one lakh plants every year

Intervention: Preserve local species, varieties and cultivars of various trees, herbs-shrubs and grasses for research and ex-situ conservation.

Strategies:-

- Establish gene bank/germ plasm conservation unit on the lines of Botanical Gardens at block level.

Medicinal and Aromatic Plants

Intervention: Promote cultivation of medicinal and aromatic plants.

Strategies:-

- Motivate farmers to take up the cultivation of ginger, turmeric, garlic, chilli, and other spices, aromatic and medicinal plants/crops.
- Those farmers who are already doing the cultivation of ginger, turmeric, garlic, chilli etc be encouraged to increase area under these crops.
- Explore the possibility of cultivation of aloevera in the district, particularly in the sandy areas in the flood plain of Soan and its tributaries and other degraded lands.
- Organize training programmes for farmers in the cultivation of medicinal and aromatic plants. Also organize exposure visits for farmers. Field staff too needs to be provided training and exposure.
- Make arrangements for the marketing of spices, aromatic and medicinal produce

(e) Agro based Rural Development Programmes

Intervention: Promote agro based new avenues of employment and income generation.

Strategies:-

- Promote cultivation of off season and exotic vegetables under protected environment (trenches, green houses, and low plastic tunnels).
- Promote cultivation of flowers.
- Promote vegetable seeds production.
- Promote mushroom cultivation.
- Promote fruit and vegetable processing.
- Promote milk processing.
- Promote back yard poultry units.
- Promote back yard turkey units.
- Promote Honey bee keeping.

(f) Food Processing Units

Intervention: Promote food processing industry for value addition to agricultural produce.

Strategies:-

- Develop entrepreneurship skill among local youth for setting up food-processing units.
- Provide incentives for setting up food processing industry.
- Make arrangement for the marketing of the processed food outside the district.

(g) Development of Rural Industries

Intervention: Promote rural industries

Strategies:-

- Develop industrial entrepreneurship skill among the locals.
- Provide additional incentives for setting up industry in rural areas which use local produce as raw material.
- Strengthen infrastructure and facilities for providing training in handloom and handicrafts.
- Provide incentives to trainees to setup their own handloom/handicraft units after the completion of the training.
- Make arrangement for the marketing of handloom and handicraft products.

(h) Agricultural Marketing

Intervention: Develop agricultural marketing for the development of Agriculture and allied sectors.

Strategies:-

- Upgrade agricultural markets at Una and Santoshgarh.
- Develop mini agricultural markets at block level.
- Organize weekly Kisan Mandis at urban centres.
- Improve road network within the district to expand marketing of fruit and vegetables to far flung areas.
- Develop marketing links of the district with Hoshiarpur, Chandigarh, Delhi and other major cities.

(i) Agricultural Credit

Intervention: Increase the role of institutional credit in the agricultural development of the area.

Strategies:-

- Encourage farmers to take loan only from banks, cooperatives and other government financial institutions.

- Simplify procedures to procure loan from banks and other financial institutions.
- Increase the credit limit of the farmers.
- Increase the role of cooperatives in advancing short term loans.

5.16: Projected outcome and Growth Rate during the present Five Year Plan

The National Development Council (NDC) has fixed the target growth rate of 4 per cent per annum for the agriculture and allied sectors at the national level for the XI Five Year Plan period. The C-DAP for Una district too has been prepared keeping that target growth rate. However those sectors which have high potential for growth such as cultivation of fruits and vegetables, their target growth rate has been fixed at a higher level. The projected outcomes of the interventions suggested above in each sector are as follows.

Horticulture:

- About 6 per cent or about 300 ha. annual increase in area. The total area under fruit cultivation will increase to over 6000 ha. by end of the Eleventh Plan. But this new plantation will not have any significant impact on the production during the plan period because new plantation will start bearing fruit only after a gap of 3-4 years, except in case of strawberry, papaya etc.
- Rejuvenation of old and unproductive orchards on 100 ha per year can result in 3-4 per cent annual growth in the production of fruits. ‘
- Reduction in gap in the existing practices and the recommended practices has the potential of 25-50 % increase in productivity of the orchards. But the actual increase will depend upon the degree to which this gap is reduced.
- Area under those fruits which have been introduced in the district more recently is likely to increase significantly.
- Post harvest losses in fruit will decrease
- Grading and packing of fruit will increase
- Processing of fruit will increase.
- The programmes like IPM and plant protection undertaken by the department will result in substantial increase in annual production.

Animal Husbandry:

- Dairy development in the district will take place in a more organized and scientific manner. Farmers will receive training and knowledge about modern techniques of dairy farming.
- Single cow dairy units and commercial dairies with herd size of 10 or more animals will increase.
- The number of cross breed cows will increase in the district.

- The productivity of cross bread cows, desi cows as well as buffaloes will increase due to genetic up gradation, better health care of the animals, improvement in the quantity and quality of feed and fodder, etc.
- All animals will be provided better health service and immunization against communicable diseases.
- The availability of fodder in the district will increase significantly.
- Poultry farming in the district is likely to become popular vocation. As a result availability of quality meat and eggs will improve in the district.

Fisheries

Area under fish farming will increase, particularly in the reclaimed lands along river Soan.

Forestry

- Tree plantation on government and community land will increase
- About on lakh plants will be planted on private lands annually.
- The availability of small timber, fuel wood and forage will improve.

Agro Based Rural Development Programmes

- Production of off season and exotic vegetables will increase
- Vegetable seed production will increase.
- Ventures like floriculture, mushroom cultivation, bee keeping will be taken up by progressive farmers
- Activities focusing on value addition to agricultural products such as cleaning, grading and packing of fruit, processing and canning of fruit will become more popular.

Food Processing Units

- Food processing units based on fruits and vegetables will increase.

Agricultural Markets

Agricultural markets at Una and Santoshgarh are likely to upgraded and some new agricultural markets will emerge at block level.

Agricultural Credit

Credit facilities for farmers will improve in the district.

Chapter- VI
District Plan

6.1 Introduction

The focus of the chapter is on the most crucial elements of this report. Section 6.2 provides an insight into the growth drivers of agriculture and allied sectors in detail. The innovative schemes which can be taken up in the district are included in section 6.3 and the vision of the XIth plan has been presented in the section 6.4. The last section of this chapter gives the detailed financial allocations for various ongoing and newly proposed programmes.

6.2 Growth Drivers

Growth drivers are those elements which play a significiant role in the growth of different sectors of economy. Following are the growth drivers for the development of agriculture and its sub-sectors:

Growth drivers of Crop sector including Horticulture sub-sector

- **Soil Health:** Soil health is one of the most crucial elements for the growth of crops, fruits and vegetables. Productivity of crops, fruits and vegetables is directly related with the fertility of the soil. Higher the fertility of soil, higher is the productivity and vice versa.
- **Land Development:** It has been observed that productivity of leveled land is generally higher than the unleveled land, because of better utilization of irrigation water and other inputs. Precision leveling by laser land leveler further enhance the productivity of the roughly leveled land in plane areas of the district.
- **Irrigation:** Role of irrigation in agricultural productivity needs no emphasis. There are marked differences in the productivity level of irrigated areas and rainfed areas. Infact certain crops like paddy and high yielding varieties of other crops and fruits and vegetables cannot be cultivated under rainfed conditions.
- **Quality Seeds and Planting Materials:** Productivity of crops and vegetables depend upon the quality of seed used. There is need for a break through in the seed development technology to accelerate the process of agricultural development. The role of quality planting material in the productivity of fruit plants is similar to that of quality seed in crop sector.
- **Use of Fertilizers and Plant Protection Chemicals:** Intensive cultivation gives very little inter-crop time for the soil to replenish its lost nutrients through natural process. As a result use of chemical fertilizers becomes imperative to maintain the productivity level of crops. Similarly, the use of plant protection chemicals has

become necessary to protect the plants from pests and diseases. However, indiscriminated and imbalanced use of chemical fertilizers and plant protection chemicals has a very harmful effect on the health of soils. Therefore the chemical fertilizers and pesticides should be used most judiciously. To minimize the harmful effects of the chemical fertilizers, farm yard manure, vermi-compost, bio-fertilizers and green manure should be used.

- **Farm Mechanization:** Farm mechanization helps in the optimum utilization of irrigation water and other inputs and timely completion of farming operations. Mechanization of farming helps in bringing more area under cultivation, increasing intensity of cultivation and better management of farming operations. All these help in enhancing the productivity and production in the state.
- **Farm Technologies:** Various kinds of farm technologies have been developed by the agricultural scientists to enhance productivity and reduce cost of production. The development of farm technologies is a continuous process and should be adequately supported. The adoption of new and relevant farm technologies is significant for Una and the state in the present situation.
- **Post Harvesting Technologies:** The role of post harvesting technologies, such as cleaning, grading, packing, storage, processing, marketing etc. are as important as farm technologies as they add value to the product and cut down post harvesting losses very significantly.
- **Agri-credit:** Provision of credit through formal financial institutions plays a very significant role for the development of agriculture and allied sectors. This facility needs to be strengthened for sustainable agriculture development in the district.
- **Government Support:** Government support in the form of subsidies and in providing infrastructure is very important for the development of agriculture. No doubt, views against subsidies, but without subsidies not much progress can be done in agriculture and allied sectors.

Agriculture

- Institutional support (skill upgradation of extension workers, farmer to farmer extension, public private partnership, strengthening ATMA, participatory research, credit support, marketing and post-harvest management, risk management, price support system)
- Programmatic intervention (synergy between state and central initiatives, role and accountability in implementing the schemes, convergence of schemes)
- Improving farmers income (diversification, agricultural marketing, agro-processing and value addition, contract farming)

Growth Drivers of Animal Husbandry

- **Animal health:** Productivity as well as fertility of animals depends on their better health. Unfortunately, animals in Una district are not very healthy. As they are provided feed that is less in quantity and poor in quality. Health care services provided by the Animal Husbandry Department are also inadequate. Thus there is need to improve the quantity and quality of animal feed and fodder, and strengthen the animal health care services in the district to enhance productivity of animals.
- **Genetic quality of animals:** Productivity of some animal breeds is higher than the other ones. For example, milk production of Jersy and H.F. cows is much higher than the desi cows. Thus, for higher productivity, only superior breeds of animals with higher productivity should be reared. Thus, genetic upgradation programmes of Animal Husbandry Department should be promoted.
- **Mechanization of Dairies:** For higher return from milch animals, the modernization of dairies is a must. In modern dairies, the animals are kept in cleaner environment, they are provided balanced and required quantity of feed and fodder, their health is regularly monitored, the record of animal pedigree and their productions are properly maintained. Milk is handled under more hygienic conditions. All these increase the productivity of animals resulting into more profits to the farmers. Thus the backyard dairies be converted into modern commercial dairies for the growth of this sector.
- **Value addition:** Value addition to animal products, whether it is milk, meat or poultry products can make animal husbandry more profitable.
- **Marketing:** Profitability depends to a great extent on the proper marketing of animal products. So proper infrastructure for the marketing of animal products serve as a growth driver.
- **Credit and Government support:** The role of credit and Government support in the development of this sector need emphasis.
- **Programmatic Intervention:** The synergy between state and central initiatives promotes responsibility and accountability in implementation of both the central and state level schemes. The convergence of the schemes is need of the hour.

Growth Drivers of Fisheries

- Infrastructure development (hatchery, pond preparation)
- Institutional support (extension, research, credit, fingerlings)
- Marketing and post-harvest management
- Risk management
- Programmatic intervention
- Community mobilization and skill upgradation

Growth Drivers of Sericulture

- Increase in the area under sericulture feed plantation
- Increase in the capacity of seed farms
- Improvement in credit and market linkages for sericulture farmers
- Effective tie up of farmer's cooperatives with weaver's cooperatives

Growth Drivers of Forestry

- Increase in community forest management
- Effective implementation of compensatory plantation activities with local participation and micro-planning
- Effective implementation of regular forest management/ silvicultural activities with community involvement.
- Increase in procurement of grower's forest produce.
- Improvement of eco-tourism facilities and identification of new sites of tourist attraction
- Minimization of diversion of forest land with local support
- Active involvement of community/citizen's groups and NGOs in pollution control measures
- Strict enforcement pollution control measures

Growth Drivers of Agricultural Marketing

- Encouraging private markets as per Amendment of Himachal Pradesh APMC Act 2005
- Encouraging contract farming in the district, if possible
- Facilitation SHGs for organized marketingof SHGs products

6.3 Innovative schemes

(i) Organic Farming

Most of the small and marginal farmers are not using chemical fertilizers and pesticides due to economic reasons. Some such farmers can be lured into organic farming by technical experts of the Agriculture Universities, Krishi Vikas Kendra and Department of Agriculture by providing them adequate training and incentives. This can be very profitable particularly in vegetables and fruits cultivation besides medical and aromatic plants cultivation. Technological and management inputs are necessary for introducing this activity.

Promoting organic farming of Desi Wheat

There is a huge market for organic desi wheat within as well as outside the district. More and more people are becoming conscious of the ill effects of consuming food items produced using chemical fertilizers, weedicides and pesticides on their health. So they are ready to pay higher prices for organic food items. Rightly sensing the market potential for

organic food, the Haryana Co-operative Supply and Marketing Federation Limited (HAFED) has planned to start marketing of organic products under group certification after sourcing them from the existing certified fields. The products identified for marketing are desi wheat, mustard oil, basmati rice and pulses. In order to maintain genetic purity of its products, HAFED has initiated contract farming of various crops in Haryana. It is reported that more than 1300 farmers in the districts of Kurukshetra, Karnal and Kaithal have shown their willingness for producing organic crops under contract farming. It is high time that HIMFED should also chalk out a similar plan for marketing organic food products. In Una district, on about 75 per cent wheat (more than 23000 hectares) is grown under rain fed conditions, therefore, the possibilities of growing organic wheat may be explored. Some parts of this area may be utilized for growing purely organic desi wheat. For promoting cultivation of organic desi wheat, two types of programmes are needed; one focusing on promoting production for commercial purpose and other for self consumption.

(ii) Medicinal and Aromatic Plants

Medicinal and aromatic plants need special attention as these are not only valuable from the health and cosmetic point of view but are also great foreign exchange earners. Extensive surveys leading to the creation of an exhaustive inventory is required. A full package of practices for the cultivation of commonly used medicinal and aromatic plants should be developed and popularized among the farmers who have assured marketing by government or private agencies. Leaving valuable plants to be exploited by commercial organizations can result in over exploitation and ultimate extinction which must be avoided at all costs.

(iii) Tourism (Focusing on Agri-Tourism)

British tourist authority defines tourism as "a stay of one or more nights away from home for holiday's, visits to friends or relatives, business conference or any other purpose, except such things as boarding, education, or semi-permanent employment"

People travel for many reasons now a days. These include

- Recreational travel;
- Adventure and sports tourism;
- Cultural tourism;
- Religious tourism;
- Health tourism; and
- Conferences and Conventions travel.

Tourism has been one of the fastest growing industries, and there are large societies entirely dependant upon the visitors for their sustenance. However, successful countries

exhibit a great capacity to continuously change their tourism product, and not get stuck in a mould. They are re-formulating the tourism product from fond to fashion to culture to appeal the visitors in their own unique ways.

The National Tourism Policy-2002 document exhibits this change as the bigger global industry and that India has immense possibilities of growth in the tourism sector with vast cultural and religious diversities, varied natural attractions. It lays down its mission to promote sustainable tourism as a means of economic growth and social integration and to promote the image of India abroad as a bright future. This is based on the concepts of; (i) Welcome (ii) Infuriation (iii) Facilitation (iv) Safety (v) Co-operation; and (vi) Infrastructure Development.

The Tourism Policy of Himachal Pradesh was laid down in 2000. The tourism policy approach paper of the state takes note of the fact that Rs. 10 lakh investment in tourism industry generates 47 jobs, where as even a labour intensive sector like agriculture provides only 44 jobs. Despite of this, a stark reality is that the tourism contributes around two per cent only to the state domestic product in a state like Himachal, where the possibilities are endless. The Mission statement of state tourism policy is to create prosperity for Himachalis, harmony with the social and cultural values of the local communities and environmental sustainability and creation of direct, indirect and ancillary new employment opportunities for the people of the state. The new state tourism policy mentions relevant and important areas for action. Its strategy approach is based on;

- Breaking the seasonal factor;
- Dispersal of tourism to larger known areas of the state; and
- Developing pilgrimage sites.

For achieving the above mentioned, the plan of action is based on;

- Basic infrastructure;
- Tourism specific infrastructure;
- Entertainment infrastructure;
- Accommodation, transport and catering; and
- Policy / Legislation.

The state government is aware of the efforts needed to bring tourism on a professional level, as evident from directives laid out in its policy statement therefore, the state tourism has to adress the urgent need of reformulating its own product and attendant strategy, to emerge as an active and dynamic player in tourism industry. For the year 2007-08, Rs. 825.30 Lakhs were earmarked for the development of tourism in the state. In addition to this, the Government of India sanctioned Rs 2201.22 Lakhs for the integrated development

of the tourist areas namely Spiti, Outer Shirag, Mani Mahesh and Sihunta-Samote focusing an Eco-tourism.

Generally Himachal Pradesh gets almost 1.5 Lakh foreign tourists annually which is 5.8 per cent of the total foreign tourists who visit India. In the domestic tourism sector, the tentative number of tourists is about 80 Lakh annually. Three fourth of the tourists comes from northern states i.e Punjab Haryana, Rajasthan, Jammu and other states. The foreign tourists prefer Himachal due to its favourable climate, peaceful atmosphere, natural beauty, less expensive, publicity etc.

Table-6.1
Districtwise (tentative) percentage of Tourists in the state

Sr. No.	Districts	Percentage of Tourists
1.	Bilaspur	3.6
2.	Chamba	7.3
3.	Hamirpur	4.6
4.	Kangra	14.5
5	Kinnour	2.1
6.	Kullu	24.5
7.	Lahul Spiti	3.1
8.	Mandi	3.8
9.	Shimla	24.8
10.	Sirmour	5.9
11.	Solan	4.0
12.	Una	1.8
	Total	100.00

Source: Department of Tourism, Himachal Pradesh

The arrival of the tourists in the state is not uniform. It is seasonal and area specific. The peak season is hardly 3-4 months in a year. Therefore, there is a need to highlight all season tourist products availability to the tourists. It is desirable that the objectives of the state tourism policy must be objective, which is a missing element in its tourism policy. The tourism sector may develop more fastly, if the state focuses it attention on the following issues by:

- promoting economically, culturally and ecologically sustainable tourism;
- promoting responsible tourism;
- using tourism as means of providing new employment opportunities in rural, tribal and remote areas;
- increasing private sector participation both as means of generating employment and providing new infrastructure;
- developing activity-based tourism to increase the duration of the tourist visits; and
- ensuring participation of local communities and PRIs/ ULBs.

Agri-Tourism

Agri-Tourism is a newly emerging area of employment generation and income enhancement in the rural sector. Before making a plan for the promotion of Agri-Tourism in Una district, one has to understand the following:

- What is agri-tourism?
- What are the main interests of an agri-tourist?
- What can Una offer to an agri-tourist?
- What management techniques should be adopted for organizing agri-tourism?
- What steps should be taken to promote agri-tourism in Una?

What is agri-tourism?

Agri-tourism is that form of tourism in which the centre of attraction is Agriculture. All those activities, operations, artifacts, buildings, structures, products, people and their way of life that are directly or indirectly associated with agriculture and allied sectors and which could be of tourists interest, forms the integral part of agro-tourism.

Interests of agri-tourists

The interests of agro-tourists can be divided into two main categories;

- The activities/things which are performed or are located in the fields; and
- Other activities/things which are performed / located in the village settlements and houses of the people.

Activities and objects of tourist interest in the fields

Landscape, irrigation techniques, crops, agricultural operations, machinery, structures, products, impact of agriculture development, traditional and modern techniques of farming, farming implements, trees, fruit plants, tasting fresh seasonal fruits, forestry, other agriculture products like sugarcane juice, jaggery, raw eatable vegetables (preferably organic), marketing of produce, storage of fodder and fuel, natural vegetation, animals, birds.

Activities and objects of tourist's interest in village settlement

Village morphology, house types, religious places, other places of worship, community buildings, schools, vocational training centres for woman, drinking water supply, health services, role of livestock in the life of people, traditional crafts like carpentary, iron smithry, spinning, weaving, dari (carpet) making, cooking of food on chullhas, storage of grains, mode of living, family structure, functioning of joint family system, social relations within the family and within the village, folk dances, folk singing, folk religion and folk sports, functioning of village level informal and formal institutions (panchayat raj system) etc.

What can Una offer?

- Stay at good places/hotels at Una;
- One day visit to religious and historical places;

- One day tour to selective villages to see the rural life within the settlements as well as in the fields;
- Stay of tourists for a few days with farmers at their homes/farms; and
- Half day visit to lakes/dams/ other places.

Historical Places: The tourists may show interest to visit the following places in the district;

- Mata Chintpurni-A very famous temple where millions of people pay visit every year;
- Dera Baba Badbhag Singh-situated on the top of the hill and surrounded by Eucalyptus trees;
- Village Amlehar-Baba Rudranand Lord Shiva Temple;
- Village Pabowal-Thakur Dawara and Dera Baba Gid Gidda Ji;
- Mehtpur-Chirnmastika Dham, a holy temple;
- Village Kotla Kalam beautiful Mahadev temple;
- Village Tiar-A nice waterfall and also Lord Shiva's temple 'SadaShiv';
- Dangoli-A small but very beautiful and blessed fully village by nature and the Bharithari Temple on the hill top and another Shiv Gudad Nath Ji temple. It is a heaven like place in the village;
- Qila-A historical fort at Una;
- Dehlan-Most magnificent village;
- Pirthipur-An ideal place having a small rivulet and beautiful mountains with full greenery. The village has famous Shiv Temple and another magnificient Baba Ji Temple on hillock. It is an idea place to live in natural surroundings; and
- Bangana-lathian-Piplu-is situated on top of Sola Singhi Dhar. View of Gobind-Sagar is fascinating from this place.

Tourists may be interested to know/visit

- General history of the village, village morphology focusing on the location of village khera, dharamshala, temple, gurudwara, common siting place/sath, ponds, panchayat ghar, schools, dispensary etc. Streets pattern, organization of houses on the basis of caste and kinship relationships. The persons guiding the tourists should have a thorough knowledge of village setting and rituals and beliefs of common folk;
- Visit to some houses to see how the people live, cook their food on chullah /tandoor etc. how the men and cattle live together. Person guiding the tourists should be able to explain the layout of the houses and their architecture in the context of the people's mode of living, their preferences and prejudices, beliefs, the gender bias within the family and the impact of recent socio-economic changes on the rural house type;

- Visit to the workshops/units of the carpenters, black smiths, potters, shoe makers, rope making, coal making, katha making and karyana shop etc;
- Visit to women groups or individuals engaged in handicrafts i.e. weaving of daris, embroidery work, especially niting and weaving, traditional decoration of houses;
- Visit to village school, health centre, gurudwara, temple or any other institution etc;
- Interaction with members of the village panchayats, nambardars, chowkidars and other learned persons; and
- Meeting with village patwari to know how the land records are maintained.

During the field visits, the focus should be on

- Crops at different stages of growth (will depend on season);
- Cultivation of leveled and unleveled fields, irrigated and rainfed fields;
- Manual and machine operated harvesting techniques (depending upon harvesting season of paddy, wheat, maize, potato);
- Water management structures and techniques such as rain water harvesting structures, watersheds, water storage tanks, sprinkler/drip irrigation system, Water distribution from tubewells to fields;
- Cultivation of vegetables, mushrooms, flowers, medicinal and aromatic plants.
- Visit to kinnow, litchi, mango, pear orchards. Tourists be offered fresh seasonal fruits at the orchards for tasting and purchasing.
- Visit to fish farms, poly houses, flowers, sericulture, mushroom, bee keeping and vermi-compost units;
- Visit to dense forests;
- Visit to Krishi Vigyan Kendre and NGOs engaged in handicrafts activities;
- Visit to some modern dairy units; and
- Interaction with progressive farmers at some selected places.

Creation of some centres of tourist's attraction

Other destinations:

- **Hill View Safari:** Camel, horse/pony ride and other recreational facilities, on the pattern of desert Safari in UAE, be developed in some hill hop areas.
- **Heritage village**: A complete model of a traditional Pahari village of traditional Pahari look be created. It should depict the traditional lifestyle of the people, traditional agricultural implements, traditional folk forms of singing, dancing and theatre (Raslila) etc.

Strengthening Infrastructure

For the promotion of agri-tourism in the district, the strengthening of the existing infrastructure is a must. The infrastructure which requires special attention is;

- Better transport network within the district;
- Inter-connection of the tourist spots within the district and better links of district headquarter with Delhi, Chandigarh, Amritsar, Shimla and other big cities;
- ATM and STD/ISD facilities at village level;
- 24 hours power supply; and
- Proper security for the tourists, especially the female tourists.

Management

Select villages with tourism potential, develop rapport with the common village folk and community leaders, develop complete data base of the village about its history, folk wisdoms, social and economic structure and update the available data base every year; organize meetings with common people as well as with progressive farmers; offer vegetarian hygienic food at the village itself.

In addition to the general tourists, there is need to attract student tourists for educational tour from other parts of the country and abroad. College and university students particularly students of geography, sociology, economics and agricultural sciences can be attracted for rural/agricultural tourism.

A variety of packages may be designed to attract all types of tourists.

6.4 The Vision

The National Planning Commission, India has approved a plan size of Rs 13778.00 crore to Himachal Pradesh for 11th Five Year Plan (2007-12). Keeping in view the national emphasis on agriculture growth, third priority has been given to 'Agriculture or Allied activities' by allocating 10.7 per cent budget (1470.08 crore) and fourth priority to 'irrigation and flood control' by earmarking 8.9 per cent budget (Rs 1220.62 crore). Agriculture happens to be the premier source of state's income. The major plan objectives in 11th Five Year Plan (2007-12) would include the provision of essential public services, increasing farm incomes, developing better infrastructure, nurturing human capital, protecting the environment and improving governance. The focus would remain on reduction of poverty, enhancing equity among various sections of the society and a balanced regional development. The other major areas, to be addressed include:

- hydro-power potential in the state;
- improving the productivity in agriculture and horticulture;
- capitalizing natural advantages in tourism, bio-diversity, medicinal and aromatic herbs, organic cultivation;
- industrialization;
- improvement in social services;

- infrastructure development especially in the areas of transport, power, rural water supply and sanitation;
- opening up the economy for private sector investment in a manner that may serve the interests of the locals; and
- Creation of productive employment;

Thus, the crux of the matter lies primarily in raising agricultural productivity and adding value to agricultural produce through necessary processing. As for the state, the agriculture development mission for district Una should be of technology based and of sustainable nature, having the features of competitiveness, stability and equitability. The agricultural economy of the district should have:

- a growth rate of 4 per cent (as fixed by the National Development Council (NDC) to rejuvenate agriculture during 11th Five Year Plan) through higher agricultural productivity, production and increasing cropping intensity;
- Extension of irrigation through minor and major irrigation projects, especially by following the strategy of watershed management;
- Increase in area under high yielding varieties of major crops especially wheat, maize and paddy
- An accelerated shift from grain crops to vegetables and fruits;
- Adding value to agricultural produce (including fruits and vegetables) through necessary agro-processing;
- Cultivation of medicinal and aromatic plants;
- Conservation of natural resources like soil, water, vegetation and bio-diversity for sustainable agricultural production; and
- 100 per cent increase in the income of land holders and agricultural labourers in next decade.

The agri-vision of the district envisages improving the quality of life of its rural population, including the underprivileged sections of rural society by widening the scope of opportunities in agriculture development process so that their income could be increased. The new thrust will be on demand based sustainable agriculture and on-value addition of agricultural produce through agro-processing.

The main objective of this vision is to increase production and productivity of agriculture and allied sectors. This can be achieved if proper and appropriate strategies are being formulated and suitable technologies are being developed/adopted to overcome the hurdles in the path of progress and exploit the potential of the area. There is a need to formulate an appropriate plan of action to achieve the above mentioned goals. Infact, the agriculture would continue to be a primary route of employment in rural areas as nearly two-thirds of rural population directly or indirectly depend on agriculture for their livelihood and

sustenance. In addition, the agriculture growth is essential for eradication of poverty in rural areas which requires priority to the development of agriculture and allied sectors. The district vision seeks a competitive and demand driven agriculture growth model, fulfilling the requirements of new globalized agricultural environment. The vision envisages promotion of agricultural infrastructure, marketing support and research and development back up- a holistic approach based on interlinkages.

The district has a good potential for raising production and productivity of all the main crops, especially maize and wheat. Likewise the district has good scope for the development of fruits cultivation especially mango, pear, kinnow and other citrus fruits and vegetables especially potato. The potential of the district for growing/promoting litchi, guava, aonla, jack fruit, papaya, plum, green almond, pomegranate, grapes and other fruits need more attention. There is a scope to exploit the newly emerging market for organic food products, especially organic desi wheat and jiggery. Certain other crops such as barley, pulses, gobhi sarson, oilseeds etc. which require comparatively less water for irrigation and can be grown under rainfed conditions, need to be promoted in the district. Cultivation of high value and off season vegetables under net houses/green houses and cultivation of flowers, spices, aromatic and medicinal plants are good options to increase the farmer's income. In addition, the allied activities such as commercial dairies with 5 to 10 high yielding milch animals, preferably cross bred cows, backyard poultry, modern poultry farming with genuine i.e. 5000 birds (Partridge farms may also be promoted), fishery, bee-keeping, mushroom cultivation etc. need to be promoted. Modernized commercial dairy farming with 50 or more high yielding animals and conversion of milk into milk products at the farm level need to be promoted as whole time occupation, especially among the educated youth. The forest based produce needs special attention. More plantation of khair and other trees will not only increase area under forestation but also accelerate the process of agro-industry i.e. katha making and production of wood coal, timber and biroza.

Goat and sheep (especially goat) rearing also needs to be promoted in rural areas to provide gainful employment to the rural households.

Processing and packaging of agriculture produce, fruits and vegetables; animal and poultry products and fish need special attention for value addition and employment generation, especially among women. Besides, pilgrimages to religious places in the district, there is a vast scope for developing agri-tourism in the district that might be exploited for the benefits of farming community and other people living in rural areas.

The district's agri-vision aims at sustainable agricultural growth which should be environment friendly, technology based and people oriented. The technology approach

should be focused on agricultural Research and Development (R&D) under the aegis of Agricultural University, Agriculture and other related departments and Krishi Vigyan Kendre. The most preferred modern technologies like bio-technology, information technology and eco-technology, blending with traditional indigenous technologies should be given the importance. The environmental approach should be focused on the conservation of natural resources like soil, water and bio-diversity. The people oriented approach should focus on those crops and varieties that are adaptable to ecological situations and amenable to demand scenario. The growth need to be coupled with equity and in a manner that enhances entitlement and need of resource poor farmers and weaker and disadvantaged sections of the society.

It is most likely that to sustain agricultural development in Himachal Pradesh, the agricultural planners will suggest more or less same rate of growth for agriculture sector and its sub-sectors for the next two plan periods (2012-17 and 2017-22) which have been fixed for 2007-12 plan period. It means that the similar strategies should have to be adopted to achieve the desired goals which have been suggested for 11th Plan (2007-12) period. However there is need to choose area specific strategies considering the specific needs of specific areas. In case of Una district, greater attention shall have to be paid to soil health, land development, irrigation, promotion of rainfed crops in those areas where the provision of irrigation is not possible for time being, adoption of high yielding crop varieties and high value crops like desi wheat, use of IntegratedNutrient Management (INM) and Integrated Pest management (IPM) techniques, bringing more area under fruits, vegetables, forests, medicinal and aromatic plants, genetic upgradation of milch animals, bee keeping, sericulture, mushroom cultivation, cultivation of fresh water fish and agri-tourism.

The vision statement stresses on technology transfer to the farmers to meet their information gaps for adopting the best available technologies to enhance the crop productivity within an eco-friendly environment. Possible efforts might be explored to promote customary hiring of agricultural machinery from the Primary Agricultural Co-operative Societies (PACSs). The PACSs should be provided tractors and other improved implements on subsidy so that the small and marginal farmers could get the benefits of machinery by hiring it from co-operatives on customary basis.

Efforts should also be made for participatory irrigation management by forming irrigation committees, under the overall supervision of gram panchayats. Lift irrigation, minor and medium irrigation shall be promoted for conservation and judicious use of water and increasing the water use efficiency while ensuring equity in distributions.

6.5 District Plan

Comprehensive annual and five year perspective plan budget for the different programmes/proposals linked to agriculture and allied sectors for the XIth plan period are as given in the tables below:

Table-6.2
Perspective Budgetary Five year Plans for the Una district

1. Land development activities

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
Water management channels underground water conveyance system (250 Tubewells)	Units (Nos.)	50	50	50	50	50	
	Cost/unit	50,000	50000	50000	50000	50,000	
	Total cost(in lakhs)	25	25	25	25	25	
	Subsidy @ 50% (in lakhs)	12.5	12.5	12.5	12.5	12.5	62.5
Land leveling in command area (3 % slope)	Units (Ha.)	60	60	60	60	60	
	Cost/unit	20,000	20,000	20,000	20,000	20,000	
	Total cost(in lakhs)	12.0	12.0	12.0	12.0	12.0	
	Subsidy @ 50% (in lakhs)	6.0	6.0	6.0	6.0	6.0	30.0
Compost making Units	Units (Nos)	200	200	200	200	200	
	Cost/unit	3,000	3,000	3,000	3,000	3,000	
	Total cost(in lakhs)	6.0	6.0	6.0	6.0	6.0	
	Subsidy @ 50% (in lakhs)	3.0	3.0	3.0	3.0	3.0	15.0
Vermi compost (for 250 hectares of fruits)	Units (Ha.)	50	50	50	50	50	
	Cost/unit	60,000	60,000	60,000	60,000	60,000	
	Total cost(in lakhs)	30.0	30.0	30.0	30.0	30.0	
	Subsidy @ 50% (in lakhs)	15.0	15.0	15.0	15.0	15.0	75.0
Bio fertilizers	Units (Ha.)	5000	5000	5000	5000	5000	
	Cost/unit	100	100	100	100	100	
	Total cost(in lakhs)	5.0	5.0	5.0	5.0	5.0	
	Subsidy @100% (in lakhs)	5.0	5.0	5.0	5.0	5.0	25.0
Gypsum for land reclamation and removing sulphur@4,000 per tonne	Units (Ha.)	200	200	200	200	200	
	Cost/unit	4,000	4,000	4,000	4,000	4,000	
	Total cost(in lakhs)	8.0	8.0	8.0	8.0	8.0	
	Subsidy @100% (in lakhs)	8.0	8.0	8.0	8.0	8.0	40.0
Micro and secondary nutrients (Zn, Fe, Mn)	Units (Ha.)	**For wheat, maize and paddy crops**					
	Cost/unit						
	Total cost(in lakhs)						
	Subsidy @100% (in lakhs)	67.5	67.5	67.5	67.5	67.5	337.5
Upgradation of one micro nutrients testing laboratay	Units (No.)	1					
	Cost/unit	30,000,00					
	Total cost(in lakhs)	30.0					
	Subsidy @100% (in lakhs)	30.0					30.0
Strengthening of general soil and water testing labortary	Units (Ha.)	1					
	Cost/unit	10,000,00					
	Total cost(in lakhs)	10.0					
	Subsidy @100% (in lakhs)	10.0					50.0
Operation and maintenance cost for above said labortries	Units (Ha.)	2	2	2	2	2	
	Cost/unit	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000	
	Total cost(in lakhs)	10.0	10.0	10.0	10.0	10.0	
	Subsidy @100% (in lakhs)	10.0	10.0	10.0	10.0	10.0	50.0
Green manuring	Units (Ha.)	500	500	500	500	500	
	Cost/unit	200	200	200	200	200	
	Total cost(in lakhs)	1.0	1.0	1.0	1.0	1.0	
	Subsidy @100% (in lakhs)	1.0	1.0	1.0	1.0	1.0	5.0
Vermi Culture	Units (Ha.)	20	20	20	20	20	
	Cost/unit	7,000	7,000	7,000	7,000	7,000	
	Total cost(in lakhs)	1.4	1.4	1.4	1.4	1.4	
	Subsidy @100% (in lakhs)	0.7	0.7	0.7	0.7	0.7	3.5
Total Subsidy in Lakhs		**168.7**	**138.7**	**138.7**	**138.7**	**138.7**	**723.5**

Table-6.3

2. Minor Irrigation

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
Tubewells	Units (Nos)	20	20	20	20	20	
	Cost/unit	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000	
	Total cost(in lakhs)	50.0	50.0	50.0	50.0	50.0	
	Subsidy@ 50% (in lakhs)	25.0	25.0	25.0	25.0	25.0	125.0
Borewell pumpsets	Units (Ha)	20	20	20	20	20	
	Cost/unit	50,000	50,000	50,000	50,000	50,000	
	Total cost(in lakhs)	10.0	10.0	10.0	10.0	10.0	
	Subsidy @50% (in lakhs)	5.0	5.0	5.0	5.0	5.0	25.0
Micro Lift projects	Units (Nos)	8	8	8	8	8	
	Cost/unit	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000	
	Total cost(in lakhs)	40.0	40.0	40.0	40.0	40.0	
	Subsidy @100% (in lakhs)	40.0	40.0	40.0	40.0	40.0	200.0
Field Drainage	Units (Ha.)	100	100	100	100	100	
	Cost/unit	15,000	15,000	15,000	15,000	15,000	
	Total cost(in lakhs)	15.0	15.0	15.0	15.0	15.0	
	Subsidy @ 100% (in lakhs)	15.0	15.0	15.0	15.0	15.0	75.0
Channelisation of Koohls	Units (Nos)	2000	2000	2000	2000	2000	
	Cost/unit	20,000	20,000	20,000	20,000	20,000	
	Total cost(in lakhs)	40.0	40.0	40.0	40.0	40.0	
(RMT Channels)	Subsidy @ 100% (in lakhs)	40.0	40.0	40.0	40.0	40.0	200.0
Rain Water Harvesting cum recharging structures	Units (Nos.)	10	10	10	10	10	
	Cost/unit	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000	
	Total cost(in lakhs)	50.0	50.0	50.0	50.0	50.0	
	Subsidy @ 100% (in lakhs)	50.0	50.0	50.0	50.0	50.0	250.0
Farm Tanks	Units (Nos)	50	50	50	50	50	
	Cost/unit	2,00,000	2,00,000	2,00,000	2,00,000	2,00,000	
	Total cost(in lakhs)	100.0	100.0	100.0	100.0	100.0	
	Subsidy @50% (in lakhs)	50.0	50.0	50.0	50.0	50.0	250.0
Safe disposal field structures	Units (Nos)	500	500	500	500	500	
	Cost/unit	10,000	10,000	10,000	10,000	10,000	
	Total cost(in lakhs)	50.0	50.0	50.0	50.0	50.0	
	Subsidy @100% (in lakhs)	50.0	50.0	50.0	50.0	50.0	250.0
Village ponds for ground water recharge and irrigation	Units (Nos)	20	20	20	20	20	
	Cost/unit	3,00,000	3,00,000	3,00,000	3,00,000	3,00,000	
	Total cost(in lakhs)	60.0	60.0	60.0	60.0	60.0	
	Subsidy @100% (in lakhs)	60.0	60.0	60.0	60.0	60.0	300.0
Micro/Drip Irrigation	Units (Ha.)	200	200	200	200	200	
	Cost/unit	50,000	50,000	50,000	50,000	50,000	
	Total cost(in lakhs)	75.0	75.0	75.0	75.0	75.0	
	Subsidy @100% (in lakhs)	75.0	75.0	75.0	75.0	75.0	375.0
Tensiometers	Units (Nos.)	100	100	100	100	100	
	Cost/unit	700	700	700	700	700	
	Total cost(in lakhs)	0.7	0.7	0.7	0.7	0.7	
	Subsidy @100% (in lakhs)	0.7	0.7	0.7	0.7	0.7	3.5
Perenial flow projects (Tapping the Hill Seepage)	Units (Nos.)	8	8	8	8	8	
	Cost/unit	10,000,00	10,000,00	10,000,00	10,000,00	10,000,00	
	Total cost(in lakhs)	80.0	80.0	80.0	80.0	80.0	
	Subsidy @100% (in lakhs)	80.0	80.0	80.0	80.0	80.0	400.0
Total Subsidy in Lakhs		**490.7**	**490.7**	**490.7**	**490.7**	**490.7**	**2453.5**

Table-6.4

3. Crop seeds

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
Seed replacement (Wheat)	Units (Ha)	6000	6000	6000	6000	6000	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	-	-	-	-	-	
	Subsidy (Rs. 500 per Ha.)	30.0	30.0	30.0	30.0	30.0	150.0
Organic desi wheat seed	Units (Ha)	400	400	400	400	400	
	Cost/unit	-	-	-	-	-	
	Total cost (in lakhs)	-	-	-	-	-	
	Subsidy (Rs. 750 per Qtl.)	3.0	3.0	3.0	3.0	3.0	15.0
Mini kits of desi wheat of 5 kg (500 per year)	Units (Ha)	-	-	-	-	-	
	Cost/unit	-	-	-	-	-	
	Total cost (in lakhs)	-	-	-	-	-	
	Subsidy (Rs. 100 per kit.)	0.5	0.5	0.5	0.5	0.5	2.5
Seed treatment (almost 20 % of total wheat sown area	Units (Ha)	6000	6000	6000	6000	6000	
	Cost/unit	100	100	100	100	100	
	Total cost (in lakhs)	6.0	6.0	6.0	6.0	6.0	
	Subsidy (Rs. 100 per kit.)	3.0	3.0	3.0	3.0	3.0	15.0
Maize seed (Hybrid maize)	Units (Ha)	500	500	500	500	500	
	Cost/unit	-	-	-	-	-	
	Total cost (in lakhs)	-	-	-	-	-	
	Subsidy (Rs. 500 per hect.)	25.0	25.0	25.0	25.0	25.0	125.0
Pulses (Mini kits of 2 kg, almost Rs 150m per kit)	Units (Nos)	1000	1000	1000	1000	1000	
	Cost/unit	-	-	-	-	-	
	Total cost (in lakhs)	-	-	-	-	-	
	Subsidy (Rs. 100 per kit.)	1.5	1.5	1.5	1.5	1.5	7.5
Oilseeds (Mini kits of 2 kg, almost Rs 150m per kit)	Units (Nos)	1000	1000	1000	1000	1000	
	Cost/unit	-	-	-	-	-	
	Total cost (in lakhs)	-	-	-	-	-	
	Subsidy (Rs. 100 per kit.)	1.5	1.5	1.5	1.5	1.5	7.5
Total Subsidy in Lakhs		**69.0**	**69.0**	**69.0**	**69.0**	**69.0**	**345.0**

Table-6.5

4. Horticulture

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
New gardans	Units (Ha.)	200	200	200	200	200	
	Cost/unit	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000	
	Total cost(in lakhs)	200.0	200.0	200.0	200.0	200.0	
	Subsidy @75% (in lakhs)	150.0	150.0	150.0	150.0	150.0	750.0
Mushroom Units (200 bags per unit/trays)	Units (Nos)	15	15	15	15	15	
	Cost/unit	1,70,000	1,70,000	1,70,000	1,70,000	1,70,000	
	Total cost(in lakhs)	25.5	25.5	25.5	25.5	25.5	
	Subsidy @ 75% (in lakhs)	19.1	19.1	19.1	19.1	19.1	95.5
Cultivation of flowers	Units (Ha.)	5	5	5	5	5	
	Cost/unit	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000	
	Total cost(in lakhs)	5.0	5.0	5.0	5.0	5.0	
	Subsidy @ 50% (in lakhs)	2.5	2.5	2.5	2.5	2.5	12.5
Sericulture with ingoted mulberry plants	Units (Ha.)	30	30	30	30	30	
	Cost/unit	15,000,00	15,000,00	15,000,00	15,000,00	15,000,00	
	Total cost(in lakhs)	30.0	30.0	30.0	30.0	30.0	
	Subsidy @50% (in lakhs)	15.0	15.0	15.0	15.0	15.0	75.0
Promotion of vegetables seeds	Units (Ha)	5	5	5	5	5	
	Cost/unit	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000	
	Total cost(in lakhs)	5.0	5.0	5.0	5.0	5.0	
	Subsidy @ 50% (in lakhs)	2.5	2.5	2.5	2.5	2.5	12.5
Setting up 2 Fruit nurseries, annual operations and supplying of plants at 50 % cost to farmers	Units (Nos)	2	-	-	-	-	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	-	-	-	-	-	
	Subsidy @ 100 % (in lakhs)	65.0	15.0	15.0	15.0	15.0	125.0

(15,000 good quality fruit plants per nursery							
Green houses normal (2500 sq. mtrs)	Units (Nos)	5	5	5	5	5	
	Cost/unit	6,00,000	6,00,000	6,00,000	6,00,000	6,00,000	
	Total cost(in lakhs)	30.0	30.0	30.0	30.0	30.0	
	Subsidy @ 50% (in lakhs)	15.0	15.0	15.0	15.0	15.0	75.0
Net houses to small farmers (subsidy @ Rs. 20,,000 per net house	Units (Nos)	500	500	500	500	500	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	-	-	-	-	-	
	Subsidy (in lakhs)	100.0	100.0	100.0	100.0	100.0	500.0
Plastic tunnels (100 sq. mtrs	Units (Nos.)	100	100	100	100	100	
	Cost/unit	30,000	30,000	30,000	30,000	30,000	
	Total cost(in lakhs)	30.0	30.0	30.0	30.0	30.0	
	Subsidy @ 50% (in lakhs)	15.0	15.0	15.0	15.0	15.0	75.0
Bee keeping for pollination	Units (Nos.)	500	500	500	500	500	
	Cost/unit	2,000	2,000	2,000	2,000	2,000	
	Total cost(in lakhs)	10.0	10.0	10.0	10.0	10.0	
	Subsidy @ 50% (in lakhs)	5.0	5.0	5.0	5.0	5.0	25.0
Community nutritional gardening (5,000 kits annually @ Rs. 40 per kit	Units (Nos.)	5000	5000	5000	5000	5000	
	Cost/unit	40	40	40	40	40	
	Total cost(in lakhs)	2.0	2.0	2.0	2.0	2.0	
	Subsidy @ 50% (in lakhs)	1.0	1.0	1.0	1.0	1.0	5.0
New crops like Turmeric, ginger etc.	Units (Ha.)	300	300	300	300	300	
	Cost/unit	20,000	20,000	20,000	20,000	20,000	
	Total cost(in lakhs)	40.0	40.0	40.0	40.0	40.0	
	Subsidy @ 50% (in lakhs)	20.0	20.0	20.0	20.0	20.0	100.0
An automatic comb foundation seed making machine and annual operations to Bee Keeping Society	Units (Nos.)	1	-	-	-	-	
	Cost/unit	-	-	-	-	-	
	-		-	-	-	-	
	Subsidy @ 100% (in lakhs)	55.0	5.0	5.0	5.0	5.0	75.0
Orchard fencing from wild and stray animals	Units (Ha.)	50	50	50	50	50	
	Cost/unit	50,000	50,000	50,000	50,000	50,000	
	Total cost(in lakhs)	25.0	25.0	25.0	25.0	25.0	
	Subsidy @ 50% (in lakhs)	12.5	12.5	12.5	12.5	12.5	62.5
Medicinal and aromatic plants	Units (Ha.)	30	30	30	30	30	
	Cost/unit	2,00,000	2,00,000	2,00,000	2,00,000	2,00,000	
	Total cost(in lakhs)	60.0	60.0	60.0	60.0	60.0	
	Subsidy @ 75% (in lakhs)	45.0	45.0	45.0	45.0	45.0	225.0
Improvement of existing orchards	Units (Ha.)	100	100	100	100	100	
	Cost/unit	80,000	80,000	80,000	80,000	80,000	
	Total cost(in lakhs)	80.0	80.0	80.0	80.0	80.0	
	Subsidy @ 50% (in lakhs)	40.0	40.0	40.0	40.0	40.0	200.0
Total Subsidy in Lakhs		**552.6**	**465.1**	**465.1**	**465.1**	**465.1**	**2413.0**

Table-6.6

5. Integrated Pest Management

		Ist Year	**IInd Year**	**IIIrd Year**	**IVth Year**	**Vth Year**	**Total**
235 Gram Panchayats (one scout per Gram Panchayat for six months @ Rs. 2500 per month per person + Rs. 1500 per person for operations)	Units (Nos)	235	235	235	235	235	
	Salary & Operation Expenditure	38.8	38.8	38.8	38.8	38.8	194.0
Total amount in Lakhs		**38.8**	**38.8**	**38.8**	**38.8**	**38.8**	**194.0**

Table-6.7

6. Social Forestry/Farm Forestry

		Ist Year	**IInd Year**	**IIIrd Year**	**IVth Year**	**Vth Year**	**Total**
Social Forestry through Gram Panchayats plantation of neem, karonja, jatropha and other plants of medicinal value (In Common lands)	Units (Ha.)	500	500	500	500	500	
	Cost/unit	20,000	20,000	20,000	20,000	20,000	
	Total cost(in lakhs)	100.0	100.0	100.0	100.0	100.0	
	Subsidy @50% (in lakhs)	50.0	50.0	50.0	50.0	50.0	250.0
Total Subsidy in Lakhs		**50.0**	**50.0**	**50.0**	**50.0**	**50.0**	**250.0**

Table-6.8

7. Sericulture Development

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
Sericulture with irrigated mulberry plants	Units (Ha.)	20	20	20	20	20	
	Cost/unit	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000	
	Total cost(in lakhs)	20.0	20.0	20.0	20.0	20.0	
	Subsidy @50% (in lakhs)	10.0	10.0	10.0	10.0	10.0	50.0
Total Subsidy in Lakhs		**10.0**	**10.0**	**10.0**	**10.0**	**10.0**	**50.0**

Table-6.9

8. Dairy Development

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
Extension and Training	Units (Nos)	-	-	-	-	-	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	1.0	1.0	1.0	1.0	1.0	
	Subsidy @100 % (in lakhs)	1.0	1.0	1.0	1.0	1.0	5.0
Improvement in Fodder Production	Units (Nos)	-	-	-	-	-	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	9.5	9.5	9.5	9.5	9.5	
	Subsidy @100% (in lakhs)	9.5	9.5	9.5	9.5	9.5	47.5
Improvement of Breeding Efficinecy	Units (Nos)	-	-	-	-	-	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	156.5	156.5	156.5	156.5	156.5	
	Subsidy @100% (in lakhs)	156.5	156.5	156.5	156.5	156.5	782.5
Calf Rearing and Management	Units (Nos)	-	-	-	-	-	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	45.1	45.1	45.1	45.1	45.1	
	Subsidy @100% (in lakhs)	45.1	45.1	45.1	45.1	45.1	225.5
Milch Cattle Improvement	Units (Nos)	-	-	-	-	-	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	49.4	49.4	49.4	49.4	49.4	
	Subsidy @100% (in lakhs)	49.4	49.4	49.4	49.4	49.4	247.0
Establishment of Gosadans	Units (Ha.)	-	-	-	-	-	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	470.0	470.0	470.0	470.0	470.0	
	Subsidy @100% (in lakhs)	470.0	470.0	470.0	470.0	470.0	2350.0
Establishment of Polyclinic With maintenance cost	Units (Nos)	-	-	-	-	-	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	45.0	5.0	5.0	5.0	5.0	
	Subsidy @100% (in lakhs)	45.0	5.0	5.0	5.0	5.0	65.0
Development of Sheep	Units (Nos)	-	-	-	-	-	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	18.7	18.7	18.7	18.7	18.7	
	Subsidy @100% (in lakhs)	18.7	18.7	18.7	18.7	18.7	93.5
Deveopment of Goats	Units (Nos)	-	-	-	-	-	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	8.3	8.3	8.3	8.3	8.3	
	Subsidy @100% (in lakhs)	8.3	8.3	8.3	8.3	8.3	41.5
Commercial Dairy (10 animals units) (2750 animals in five years)	Units (Nos)	40	40	40	40	40	
	Cost/unit	-	-	-	-	-	
	Total cost(in lakhs)	-	-	-	-	-	
	Subsidy (in lakhs)	30.0	30.0	30.0	30.0	27.0	147.0
Milk Bulk Cooling Units (Milk Co-operative Societies)	Units (Nos)	1	1	1	1	1	
	Cost/unit	8,00,000	8,00,000	8,00,000	8,00,000	8,00,000	
	Total cost(in lakhs)	8.0	8.0	8.0	8.0	8.0	
	Subsidy @75% (in lakhs)	6.0	6.0	6.0	6.0	6.0	30.0
Establishment of Mini Milk Processing Units at Dairy Farms	Units (Nos)	1	1	1	1	1	
	Cost/unit	20,000,00	20,000,00	20,000,00	20,000,00	20,000,00	
	Total cost(in lakhs)	20.0	20.0	20.0	20.0	20.0	
	Subsidy @50% (in lakhs)	10.0	10.0	10.0	10.0	10.0	50.0
Dairy Education Training & Extension (Trainings)	Units (Nos)	40	40	40	40	40	
	Cost/unit	5,000	5,000	5,000	5,000	5,000	
	Total cost(in lakhs)	2.0	2.0	2.0	2.0	2.0	
	Subsidy @100% (in lakhs)	2.0	2.0	2.0	2.0	2.0	10.0
Cattle feed manufacturing	Units (Nos)	1	1	1	1	1	
	Cost/unit	10,000,00	10,000,00	10,000,00	10,000,00	10,000,00	
	Total cost(in lakhs)	10.0	10.0	10.0	10.0	10.0	
	Subsidy @25% (in lakhs)	2.5	2.5	2.5	2.5	2.5	12.5
Work animals (Mule)	Units (Nos)	100	100	100	100	100	
	Cost/unit	30,000	30,000	30,000	30,000	30,000	
	Total cost(in lakhs)	3.0	3.0	3.0	3.0	3.0	
	Subsidy @50% (in lakhs)	1.5	1.5	1.5	1.5	1.5	7.5
Wok animals (Bullock pair)	Units (Nos)	100	100	100	100	100	
	Cost/unit	20,000	20,000	20,000	20,000	20,000	
	Total cost(in lakhs)	2	2	2	2	2	
	Subsidy @50% (in lakhs)	1	1	1	1	1	5.0
Total Subsidy in Lakhs		**856.5**	**815.8**	**815.8**	**815.8**	**815.8**	**4119.5**

Note: Full detail see in 5th Chapter under Dairy Development Plan

Table-6.10

9. Piggeries

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
Piggery Units	Units (Nos)	10	10	10	10	10	
	Cost/unit	40,000	40,000	40,000	40,000	40,000	
(10 + 1)	Total cost(in lakhs)	4.0	4.0	4.0	4.0	4.0	
	Subsidy @50% (in lakhs)	2.0	2.0	2.0	2.0	2.0	10.0
Total Subsidy in Lakhs		**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**10.0**

Table-6.11

10. Poultry

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
Broiler Units (500 birds)	Units (Nos)	10	10	10	10	10	
	Cost/unit	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000	
	Total cost(in lakhs)	10.0	10.0	10.0	10.0	10.0	
	Subsidy @50% (in lakhs)	5.0	5.0	5.0	5.0	5.0	25.0
Layer Units (500 birds)	Units (Nos)	20	20	20	20	20	
	Cost/unit	1,25,000	1,25,000	1,25,000	1,25,000	1,25,000	
	Total cost(in lakhs)	25.0	25.0	25.0	25.0	25.0	
	Subsidy @50% (in lakhs)	12.5	12.5	12.5	12.5	12.5	62.5
Total Subsidy in Lakhs		**17.5**	**17.5**	**17.5**	**17.5**	**17.5**	**87.5**

Table-6.12

11. Fishery/Bee keeping/Rabbitory

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
Running water fish culture units	Units (Nos)	5	5	5	5	5	
	Cost/unit	40,000	40,000	40,000	40,000	40,000	
	Total cost(in lakhs)	2.0	2.0	2.0	2.0	2.0	
(100mx2my1.5m)	Subsidy @ 50% (in lakhs)	1.0	1.0	1.0	1.0	1.0	5.0
Extensive fish farm in new pond	Units (Ha)	5	5	5	5	5	
	Cost/unit	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000	
	Total cost(in lakhs)	12.5	12.5	12.5	12.5	12.5	
	Subsidy @50% (in lakhs)	6.3	6.3	6.3	6.3	6.3	31.5
Trout fish farms	Units (Nos)	5	5	5	5	5	
	Cost/unit	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000	
2(1.5mx2my1.5m)	Total cost(in lakhs)	12.5	12.5	12.5	12.5	12.5	
	Subsidy @50% (in lakhs)	6.3	6.3	6.3	6.3	6.3	31.5
Italian bee with pollination service	Units (Nos)	20	20	20	20	20	
	Cost/unit	1,25,000	1,25,000	1,25,000	1,25,000	1,25,000	
	Total cost(in lakhs)	25.0	25.0	25.0	25.0	25.0	
(30 colony)	Subsidy @50% (in lakhs)	12.5	12.5	12.5	12.5	12.5	62.5
Rabbit rearing	Units (Nos)	50	50	50	50	50	
	Cost/unit	1,30,000	1,30,000	1,30,000	1,30,000	1,30,000	
	Total cost(in lakhs)	65.0	65.0	65.0	65.0	65.0	
(100 animals) with shed	Subsidy @50% (in lakhs)	32.5	32.5	32.5	32.5	32.5	162.5
Total Subsidy in Lakhs		**58.6**	**58.6**	**58.6**	**58.6**	**58.6**	**293.0**

Table-6.13

12. Farm mechanization to Co-operative Societies (subsidy @ 50 per cent)

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
Tractors (societies)	Units (Nos)	10	10	10	10	10	
	Cost/unit	3,75,000	3,75,000	3,75,000	3,75,000	3,75,000	
	Total cost(in lakhs)	37.5	37.5	37.5	37.5	37.5	
	Subsidy @50% (in lakhs)	18.8	18.8	18.8	18.8	18.8	94.0
Land laser Leveler (With tractor) (societies)	Units (Nos)	1	1	1	1	1	
	Cost/unit	8,000,00	8,000,00	8,000,00	8,000,00	8,000,00	
	Total cost(in lakhs)	8.0	8.0	8.0	8.0	8.0	
	Subsidy @50% (in lakhs)	4.0	4.0	4.0	4.0	4.0	20.0
Seed drills (wheat) societies	Units (Nos)	3	3	3	3	3	
	Cost/unit	20,000	20,000	20,000	20,000	20,000	
	Total cost(in lakhs)	0.6	0.6	0.6	0.6	0.6	
	Subsidy @50% (in lakhs)	0.3	0.3	0.3	0.3	0.3	1.5
Potato seed machine (societies)	Units (Nos)	3	3	3	3	3	
	Cost/unit	30,000	30,000	30,000	30,000	30,000	
	Total cost(in lakhs)	0.9	0.9	0.9	0.9	0.9	
	Subsidy @50% (in lakhs)	0.4	0.4	0.4	0.4	0.4	2.0
Rotavators (societies)	Units (Nos)	3	3	3	3	3	
	Cost/unit	80,000	80,000	80,000	80,000	80,000	
	Total cost(in lakhs)	2.4	2.4	2.4	2.4	2.4	
	Subsidy @50% (in lakhs)	1.2	1.2	1.2	1.2	1.2	6.0
Potato diggers (societies)	Units (Nos)	4	4	4	4	4	
	Cost/unit	40,000	40,000	40,000	40,000	40,000	
	Total cost(in lakhs)	1.6	1.6	1.6	1.6	1.6	
	Subsidy @50% (in lakhs)	0.8	0.8	0.8	0.8	0.8	4.0
Hand driven sprayers (Individuals)	Units (Nos)	300	300	300	300	300	
	Cost/unit	1,500	1,500	1,500	1,500	1,500	
	Total cost(in lakhs)	4.5	4.5	4.5	4.5	4.5	
	Subsidy @50% (in lakhs)	2.2	2.2	2.2	2.2	2.2	11.0
Miscellaneous (tillers, discs, trolleys etc.) (societies)	Units (Nos)	30	30	30	30	30	
	Cost/unit	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000	
	Total cost(in lakhs)	30.0	30.0	30.0	30.0	30.0	
	Subsidy @50% (in lakhs)	3.0	3.0	3.0	3.0	3.0	15.0
Machinery and equipments for orchards (Crates)	Units (Nos)	3000	3000	3000	3000	3000	
	Cost/unit	200	200	200	200	200	
	Total cost(in lakhs)	5.0	5.0	5.0	5.0	5.0	
	Subsidy @50% (in lakhs)	2.5	2.5	2.5	2.5	2.5	12.5
Machinery and equipments for orchards (Mango/fruit pickers)	Units (Nos)	20	20	20	20	20	
	Cost/unit	5,000	5,000	5,000	5,000	5,000	
	Total cost(in lakhs)	1.0	1.0	1.0	1.0	1.0	
	Subsidy @50% (in lakhs)	0.5	0.5	0.5	0.5	0.5	2.5
Machinery and equipments for orchards (Prooning equipment)	Units (Nos)	200	200	200	200	200	
	Cost/unit	600	600	600	600	600	
	Total cost(in lakhs)	1.2	1.2	1.2	1.2	1.2	
	Subsidy @50% (in lakhs)	0.6	0.6	0.6	0.6	0.6	3.0
Machinery and equipments for orchards (Folding saw)	Units (Nos)	60	60	60	60	60	
	Cost/unit	1500	1500	1500	1500	1500	
	Total cost(in lakhs)	0.9	0.9	0.9	0.9	0.9	
	Subsidy @50% (in lakhs)	0.5	0.5	0.5	0.5	0.5	2.5
Machinery and equipments for orchards (electric saw)	Units (Nos)	1	1	1	1	1	
	Cost/unit	1,000,00	1,000,00	1,000,00	1,000,00	1,000,00	
	Total cost(in lakhs)	1.0	1.0	1.0	1.0	1.0	
	Subsidy @50% (in lakhs)	0.5	0.5	0.5	0.5	0.5	2.5
Machinery and equipments for orchards (picking ledders)	Units (Nos)	30	30	30	30	30	
	Cost/unit	1,500	1,500	1,500	1,500	1,500	
	Total cost(in lakhs)	0.45	0.45	0.45	0.45	0.45	
	Subsidy @50% (in lakhs)	0.2	0.2	0.2	0.2	0.2	1.0
Machinery and equipments for orchards (power sprayers)	Units (Nos)	30	30	30	30	30	
	Cost/unit	25,000	25,000	25,000	25,000	25,000	
	Total cost(in lakhs)	7.5	7.5	7.5	7.5	7.5	
	Subsidy @50% (in lakhs)	3.8	3.8	3.8	3.8	3.8	19.0
Machinery and equipments for orchards (digger)	Units (Nos)	4	4	4	4	4	
	Cost/unit	40,000	40,000	40,000	40,000	40,000	
	Total cost(in lakhs)	1.6	1.6	1.6	1.6	1.6	
	Subsidy @50% (in lakhs)	0.8	0.8	0.8	0.8	0.8	4.0
Machinery and equipments for orchards (potable	Units (Nos)	1	1	1	1	1	
	Cost/unit	3,50,000	3,50,000	3,50,000	3,50,000	3,50,000	

citrus graders)	Total cost(in lakhs)	3.5	3.5	3.5	3.5	3.5	
	Subsidy @50% (in lakhs)	1.8	1.8	1.8	1.8	1.8	9.0
Potato Planters	Units (Nos)	4	4	4	4	4	
	Cost/unit	3,000	3,000	3,000	3,000	3,000	
	Total cost(in lakhs)	1.2	1.2	1.2	1.2	1.2	
	Subsidy @50% (in lakhs)	0.6	0.6	0.6	0.6	0.6	3.0
Hadamba Threshers	Units (Nos)	10	10	10	10	10	
	Cost/unit	50,000	50,000	50,000	50,000	50,000	
	Total cost(in lakhs)	5.0	5.0	5.0	5.0	5.0	
	Subsidy @50% (in lakhs)	2.5	2.5	2.5	2.5	2.5	12.5
Zero Till Dril	Units (Nos)	3	3	3	3	3	
	Cost/unit	20,000	20,000	20,000	20,000	20,000	
	Total cost(in lakhs)	0.6	0.6	0.6	0.6	0.6	
	Subsidy @50% (in lakhs)	0.3	0.3	0.3	0.3	0.3	1.5
Self propelled power/weeder sprayers	Units (Nos)	2	2	2	2	2	
	Cost/unit	60,000	60,000	60,000	60,000	60,000	
	Total cost(in lakhs)	1.2	1.2	1.2	1.2	1.2	
	Subsidy @50% (in lakhs)	0.6	0.6	0.6	0.6	0.6	3.0
Maize sheller	Units (Nos)	12	12	12	12	12	
	Cost/unit	25,000	25,000	25,000	25,000	25,000	
	Total cost(in lakhs)	3.0	3.0	3.0	3.0	3.0	
	Subsidy @50% (in lakhs)	1.5	1.5	1.5	1.5	1.5	7.5
Total Subsidy in Lakhs		**45.4**	**45.4**	**45.4**	**45.4**	**45.4**	**227.0**

Table-6.14

13. Markets & Cold storage

		Ist Year	**IInd Year**	**IIIrd Year**	**IVth Year**	**Vth Year**	**Total**
Agriculture produce markets	Units (Nos)	1	1	1	1	1	
	Cost/unit	1,00,000,00	1,00,000,00	1,00,000,00	1,00,000,00	1,00,000,00	
	Total cost(in lakhs)	100.0	100.0	100.0	100.0	100.0	
	Subsidy @50 % (in lakhs)	25.0	25.0	25.0	25.0	25.0	125.0
Apni mandi	Units (Nos)	1	1	-	-	-	
	Cost/unit	15,00,000	15,00,000	-	-	-	
	Total cost(in lakhs)	15.0	15.0	-	-	-	
	Subsidy @50% (in lakhs)	3.8	3.8	-	-	-	7.6
Cold storage (Cooperative societies)	Units (Nos)	1	1	1	1	1	
	Cost/unit	70,00,000	70,00,000	70,00,000	70,00,000	70,00,000	
	Total cost(in lakhs)	70.0	70.0	70.0	70.0	70.0	
	Subsidy @50 % (in lakhs)	35.0	35.0	35.0	35.0	35.0	175.0
Total Subsidy in Lakhs		**63.8**	**63.8**	**60.0**	**60.0**	**60.0**	**307.6**

Table-6.15

14. Renewable sources of energy and waste utilization

		Ist Year	**IInd Year**	**IIIrd Year**	**IVth Year**	**Vth Year**	**Total**
Bio Gas Plants KVIC model 6 CUM	Units (Nos)	20	20	20	20	20	
	Cost/unit	40,000	40,000	40,000	40,000	40,000	
	Total cost(in lakhs)	8.0	8.0	8.0	8.0	8.0	
	Subsidy @50% (in lakhs)	4.0	4.0	4.0	4.0	4.0	20.0
Total Subsidy in Lakhs		**4.0**	**4.0**	**4.0**	**4.0**	**4.0**	**20.0**

Table-6.16

15. Agro and Food Processing Industry

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
Grain based Units	Units (Nos)	1	1	1	1	1	
	Cost/unit	50,00,000	50,00,000	50,00,000	50,00,000	50,00,000	
	Total cost(in lakhs)	50.0	50.0	50.0	50.0	50.0	
	Subsidy @25 % (in lakhs)	12.5	12.5	12.5	12.5	12.5	62.5
Fruit and vegetable based Units	Units (Nos)	5	5	5	5	5	
	Cost/unit	10,00,000	10,00,000	10,00,000	10,00,000	10,00,000	
	Total cost(in lakhs)	50.0	50.0	50.0	50.0	50.0	
	Subsidy @ 25 % (in lakhs)	12.5	12.5	12.5	12.5	12.5	62.5
Meat and poultry based Units	Units (Nos)	1	1	1	1	1	
	Cost/unit	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000	
	Total cost(in lakhs)	5.0	5.0	5.0	5.0	5.0	
	Subsidy @25% (in lakhs)	1.2	1.2	1.2	1.2	1.2	6.0
Total Subsidy in Lakhs		**26.2**	**26.2**	**26.2**	**26.2**	**26.2**	**131.0**

Table-6.17

16. Training and Mass campaigns on Agriculture and allied sectors

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
To cover expensives of materials, traveling and contingency related to mass campaign	Subsidy @100% (in lakhs)	25.0	25.0	25.0	25.0	25.0	125.0
Farmer training centre and its operational costs (25 lakhs per year)	Subsidy @100% (in lakhs)	25.0	25.0	25.0	25.0	25.0	125.0
Total Subsidy in Lakhs		**50.0**	**50.0**	**50.0**	**50.0**	**50.0**	**250.0**

Table-6.18

17. Rural Based Non-farm Activities

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
Rural Artisans	Units (Nos)	100	100	100	100	100	
	Cost/unit	50,000	50,000	50,000	50,000	50,000	
	Total cost(in lakhs)	50.0	50.0	50.0	50.0	50.0	
	Subsidy @25% (in lakhs)	12.5	12.5	12.5	12.5	12.5	62.5
Tiny sector units	Units (Nos)	50	50	50	50	50	
	Cost/unit	2,00,000	2,00,000	2,00,000	2,00,000	2,00,000	
	Total cost(in lakhs)	100.0	100.0	100.0	100.0	100.0	
	Subsidy @25% (in lakhs)	25.0	25.0	25.0	25.0	25.0	125.0
Total Subsidy in Lakhs		**37.5**	**37.5**	**37.5**	**37.5**	**37.5**	**187.5**

Table-6.19

18. Agri Tourism

		Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
Organization of rural melas	Units (Nos)	4	4	4	4	4	
	Cost/unit	2,00,000	2,00,000	2,00,000	2,00,000	2,00,000	
	Total cost(in lakhs)	8.0	8.0	8.0	8.0	8.0	
	Subsidy @100% (in lakhs)	8.0	8.0	8.0	8.0	8.0	40.0
Promotion of Agri tourist Centres	Units (Nos)	5	5	5	5	5	
	Cost/unit	10,00,000	10,00,000	10,00,000	10,00,000	10,00,000	
	Total cost(in lakhs)	50.0	50.0	50.0	50.0	50.0	
	Subsidy @ 100%	50.0	50.0	50.0	50.0	50.0	250.0
Total Subsidy in Lakhs		**58.0**	**58.0**	**58.0**	**58.0**	**58.0**	**290.0**

Table-6.20

Total Five Year Perspective Budgetary Plans for the Una district (In Lakhs)

S.No.	Works	Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	Total
1.	Land Development Activities	168.7	138.7	138.7	138.7	138.7	723.5
2.	Minor Irrigation	490.7	490.7	490.7	490.7	490.7	2453.5
3.	Crop Seeds	69.0	69.0	69.0	69.0	69.0	345.0
4.	Horticulture	552.6	465.1	465.1	465.1	465.1	2413.0
5.	Integrated Pest Management	38.8	38.8	38.8	38.8	38.8	194.0
6.	Social Forestry/Farm Forestry	50.0	50.0	50.0	50.0	50.0	250.0
7.	Sericulture Development	10.0	10.0	10.0	10.0	10.0	50.0
8.	Dairy Development	856.5	815.8	815.8	815.8	815.8	4119.7
9.	Piggeries	2.0	2.0	2.0	2.0	2.0	10.0
10.	Poultry	17.5	17.5	17.5	17.5	17.5	87.5
11.	Fishery/Bee Keeping/Rabbitory	58.6	58.6	58.6	58.6	58.6	293.0
12.	Farm mechanization to Co-operative Societies (subsidy @ 50 per cent)	45.4	45.4	45.4	45.4	45.4	227.0
13.	Markets & Cold storage	63.8	63.8	60.0	60.0	60.0	307.6
14.	Renewable sources of energy and waste utilization	4.0	4.0	4.0	4.0	4.0	20.0
15.	Agro and Food Processing Industry	26.2	26.2	26.2	26.2	26.2	131.0
16.	Training and Mass Campaign on Agriculture and allied sectors	50.0	50.0	50.0	50.0	50.0	250.0
17.	Rural Based Non-farm Activities	37.5	37.5	37.5	37.5	37.5	187.5
18.	Agri Tourism	58.0	58.0	58.0	58.0	58.0	290.0
	Total	**2599.3**	**2440.1**	**2437.3**	**2437.3**	**2437.3**	**12352.3**

Chapter – VII
Other Priority Sectors

Introduction

This chapter covers some of the priority sectors which are very essential for rural development and also have direct or indirect impact on agriculture and allied sectors. The inclusion of these sectors in this report will also help in integrating the agricultural plan with the rural development programmes and the general development plan of the district.

7.1 Education

Elementary Education

In consonance with the National Policy of Elementry Education, it has been the endeavour of the state government to provide educational facilities within the reach of students. The Directorate of Primary Education was set up in 1984 to ensure universalization of primary education. It was renamed as The Directorate of Elementary Education' in 2005 with objectives

- to achieve the goal of universalization of education;
- to provide quality education; and
- to increase access to education.

Himachal Pradesh had 10607 primary/junior basic, 3847 middle/senior basic, 1850 high/higher secondary schools in 2006-07. There were 64 colleges of general education. The number of students in these schools and colleges was 5.23, 3.36, 3.74 and 0.60 lakh respectively. In addition to this, there were 4 universities, 69 arts and science colleges, 3 medical colleges, 23 collges of education, 20 sanskrit colleges, 12 teacher's training schools, 6 poly-technic institutions and 4 dental colleges in the state. As per the national policy approach, the attempts are also being made to cater the educational needs of girl child and disabled children.

To encourage enrolment, reduce the drop out rate and enhance the retention rate of the children in the schools, various scholarships and other incentives namely Poverty Stipend Scholarship, Scholarship for Children of Army Personnel, Scholarship for the students belonging to IRDP families, Pre-matric scholarship for Scheduled Castes students, Lahaul & Spiti Pattern Scholarship and Scholarship for the Children of Army Personnel who are serving at the border areas are being given/ distributed to the students of primary schools in the State. In addition, free text books are being distributed for OBC/IRDP students in non tribal areas. Free text books and uniforms to SCs students under Scheduled Castes Component Plan (SCP) are also being provided. Free text books and uniforms are also

given under Tribal Area Sectoral Plan (TASP). Such incontired are also given to all girls' students of general caste category in primary schools under Sarva Shiksha Abhiyan for enhanceing female literacy in the state. The revised text books from class Ist to Vth have been prepared and introduced in all govt. primary schools. Mid-day meal scheme is being implemented in all the govt. and govt. aided primary schools to compliance the order of the Honble Supreme Court of India. Under this scheme each student is getting hot cooked meal on teaching days. Computer Education Programme has been started in 282 upper primary schools in the remotest parts of the state. The government has decided to introduce Punjabi and Urdu languages in 100 selected High/Senior Secondary Schools in the state from class 6th onwards w.e.f. academic year 2007-08.

The following incentives have been provided to promote education in the state:

- Middle Merit Scholarship @ Rs. 400/- and Rs. 800/- per annum per boy and girl respectively.
- Scholarship for IRDP families children @ Rs. 250/- and Rs. 500/- per annum per boy and girl respectively.
- Pre-matric Scholarship for the children of STs/SCs/OBCs families @ Rs. 150/- per annum.
- Scholarship for the children of military personnel @ Rs. 150/- per annum per student.

Sarva Shiksha Abhiyan (SSA) has been implemented, as per the guidelines of Govt of India, to achieve the objectives; (i) to provide elementary education to all children upto the age of 6-14 years by 2010; and (ii) to bridge social, regional and gender gaps, with the active participation of the community in the management of schools.

The funding pattern of SSA in the 10th Plan period was in the ratio of 75:25 i.e. central and state governments. It has been revised in the ratio of 65:35 from 2007-08.

The following efforts have been made to promote quality education under SSA:

- Kshamta: - The State Mission Authority has been set up for establishing Resource Groups at state, district, block, cluster and school level;
- Shakti - This is a special initiative with a focus on mother and girl child;
- Shiksha Vimarsh - This is an open discussion forum on education for teachers and other stakeholders held once in every two months;
- Read and Reflect – This is to make teachers read and discuss on issues related to education;
- Akkar Bakkar - a monthly magazine for children;
- Bala - Building as Learning Aids to design the school buildings;
- Kitab – establishing libraries in the schools so that the children can get supplementary reading material; and

- Aadhaar-2007- To improve the basic learning skills at primary level.

Technical Education

Technical education is being promoted through National Institute of Technology (NIT), Hamirpur, Jawaharlal Nehru, Govt. Engineering College Sundernagar, 5 Privately managed engineering colleges, 8 Govt. Polytechnics and 1 Polytechnic in Private Sector, 59 Co-education Industrial Training Institutes including one Institute for physically handicapped and 16 Industrial Training Institutes for women and one Motor Driving Training school, 57 Industrial Training Centres (Pvt.) and 257 Vocational Training Centers in Private Sector, 1 govt. B-Pharmacy college Rohroo, 6 B-Pharmacy college in private sector and 2 D-Pharmacy college in private sector are functioning in the Pradesh. The ITI/ITCs are providing 1-2 years certificate courses in 20 engineering and 22 non-engineering trades. Four ITIs have been upgraded as Centre of Excellence during the year 2006-07 and Six I.T.Is have been selected for up gradation into Centre of Excellence under the World Bank Aided Scheme from the academic session 2007-08. 13 I.T.Is were proposed to be upgraded under Public Partnership Mode. Government Polytechnic Sundernagar, Hamirpur and Kandaghat have been covered under Technical Education. Quality improvements Programme of World Bank Project enable these Institutions to become Centers of Excellence in the field of Technical Education.

Education in district Una

Una district has 505 primaries, 118 middle, and 128 high and senior secondary schools. In addition, the district has 7 colleges and 4 Sanskrit colleges.

Table-7.1
Status of Educational Institutions in Una

Year	Primary School			Middle School			High Senior Secondary School			Colleges		
	No.	No. of Teachers	No. of Students	No.	No. of Teachers	No. of Students	No.	No. of Teachers	No. of Students	No.	No. of Teachers	No. of Students
2000-01	502	1654	47148	101	530	31793	99	1428	20523	5	52	3109
2001-02	503	1598	45142	101	518	32608	99	1342	21784	5	55	3300
2002-03	506	1443	43161	101	556	32597	99	1365	22053	7	57	3211
2003-04	506	1498	41850	109	596	33374	100	1374	25022	7	57	3400
2004-05	506	1490	40344	116	443	9603	105	1422	42017	7	60	3220
2005-06	506	1478	37632	116	551	9123	105	1526	41964	7	129	7108
2006-07	505	1416	35820	118	562	7918	114	1610	42854	7	133	6678
2007-08	505	1221	34540	118	767	7528	128	1761	44328	7	129	6085

Source: Department of Education, Una

The technical institutions in the district are imparting education and training to the students in the area of automobile, fitter, turner, electrician, carpenter, motor driving and earth moving machinery, computer, tool and die, IIT maker, auto electrical and electronic machinery, fashion technology, dress making, tailoring and knitting. The technical institutions in the district have 390 seats (318 male + 72 female) under different trades. Against these seats, the number of students was 371 (302 males and 69 females). The state poletechnic institution Una has enrolled of 123 students against 160 allocated seats in the

trades of Computer Engineering, Architechure Assistant Modern Office Practice and Electronics Communication.

7.2 Health Services

So far as the health services in the district one concerned, Una district has one Regional Hospital located at Una with beds strength of 200. Currently the hospital is providing essential and emergency services to the patients. But in future it will provide specialized services. One 30 beds Civil Hospital is located at Mata Chintpurni, equipped with of OPD and indoor facilities. There are 5 Community Health Centres (CHCs) located at Haroli, Gagret, Daulatpur, Amb and Bangana to provide basic health facilities at the local level. Each CHC covers about 85,000 populations, which is less than the state norms of one lakh. Below the CHCs, there are 19 Primary Health Centres (PHCs). On an average, each PHC provides health services to less than 20,000 populations. PHC controls 134 sub centres. Out of the total sub centres, 63 cover population less than the norms of 3,000 each and 61 serves more than 3,000 population each.

The district has one ESI dispensary at the industrial town of Mehatpur. 2 Ayurvedic Hospitals, one located at Una and the other at Isspur in Gagret block. The district has 69 Ayurvedic Centres, which provide day care curative services. One Naturopathy Clinic is also functioning in the district.

The district wise and block wise distribution of Health Institutions in the district are as follows:

Table-7.2
District wise distribution of Health Institutions

Name of Health Institution	Numbers
Regional Hospital	1
Civil Hospital	1
Community Health Centres	15
Primary Health Centres	19
Sub Centres	134
ESI dispensary	1
Ayurvedic Hospitals	2
ISM Ayurvedic Centres	69
Naturopathy Clinic	1
Total	243

Source: District Health Plan, Una

Table-7.3
Block wise distribution of Health Institutions

Block	CHCs	PHCs	Sub Centres	AHCs	CHs	AWWs
Bangana	1	3	24	16	0	205
Gagret	2	4	27	16	0	235
Amb	1	6	41	20	1	244
Una	0	0	0	0	0	315
Haroli	1	6	42	17	0	354
Total	**5**	**19**	**134**	**69**	**1**	**1353**

Source: District Health Plan, Una

As mentioned above, Una district has a wide network of health institutions and the average population covered by Sub Centre, PHC and CHC is less than the state norms of 3,000, 20,000 and 1, 00,000 respectively. In fact the district has parallel set up of both of allopathic and Ayurvedic health institutions at certain locations. In case of indoor health facilities, the sanctioned beds strength in the district is 439 but only 366 beds are in position or existence. Therefore, the beds number is inadequate as per norms. The provision is one bed for a population of 1000 persons. There is an imbalance in beds strength at the level of secondary and primary health care units i.e. CHCs and PHCs.

Need is to rationalize the number of beds at different levels of health institutions.For example the district head quarter Una has two hospitals, one Ayurvedic and one Homeopathic dispensary with beds strength of 200 which becomes 55 per cent of the total 366 existing beds in the district.

Location wise also, there is an imbalance among existing health institutions. Data show that the following gram panchayats have more than one health institution.

- Churru (PHC and AHC)
- Isspur (Sub Centre and Ayurvedic Hospital)
- Bathri (PHC and Sub Centre)
- Lathiani (AHC and PHC)
- Joh, Saloh and Khadd (AHC, and Sub Centre)
- Polian Prohitan two Sub Centres. (Naloh and Polian)
- Bohru two Sub Centres. (Churari & Chogath)
- Thara two Sub Centres. (Saili & Talai)
- Lohara Upper two Sub Centres. (Chah Bag & Thanikpur)
- Polian Beet two Sub Centres (Polian Beet & Janani)
- Baroh two Sub Centres (Pambara & Bhaderkali)

On the other hand, the following gram panchayats have not a single health institution:

Table-7.4
Detail of Gram Panchayats which have not a single Health Institution

Block Amb	Block Bangana	Block Gagret	Block Haroli
1. Bhagrah	1. Barrian	1. Abheypur	1. Abada Barana
2. Chhaproh	2. Doghi	2. Badoh	2. Ajnoli
3. Stothar		3. Bhanjal Upper	3. Arniala Lower
4. Jawal		4. Dangoh Khurd	4. Bangrah
5. Karluhi			5. Bhatt kalan
			6. Dehlan Upper
			7. Dhatwara
			8. Fatehpur
			9. Hira Nagar
			10. Jhamber
			11. Lal Singhi
			12. Lamlehra
			13. Madanpur
			14. Rora

Source: District Health Plan, Una

110 Gram Panchayats in the district are without sub centres. The blockwise detail shows that there is a dire need to rationalize the location of sub centres and after rationalization if there is need, then more sub centres should be established in those gram panchayats, which are without sub centres.

Table-7.5
Detail of Gram Panchayats without sub centre's

Block Amb	Bloch Gagret	Block Haroli	Block Bangana	Block Una
1. Amb	1. Abheypur	1. Badhera	1. Berain	1. Abada Barana
2. Andura	2. Amlehar	2. Badhera Lower	2. Budhan	2. Ajnoli
3. Behar Jaswan	3. Badehra Rajputan	3. Bat- Kalan	3. Changer5	3. Ajoli
4. Bhagrah	4. Badoh	4. Bhadsali	4. Chauki Khas	4. Arniala (Lower)
5. Chhaproh	5. Bhanjal (Lower)	5. Bhadsali –H Lower	5. Chhaproh Kalan	5. Arniala (Upper)
6.Churdu	6. Bhanjal (Upper)	6. Bhadiaran	6. Deehar	6. Barnoh
7. Dharamsal Mahanta	7. Dangoh Khurd	7. Chandpur	7. Dohgi	7. Basal (Lower)
8. Dharamsal M. Khas	8. Gagret (Upper)	8. Dulehar	8. Hatli Kesru	8. Bhatoli
9. Dhusara	9. Goindpur B (Lower)	9. Goindpur Jaichand	9. Karmali	9. Binewal
10. Dhusara Satother	10. Joh	10. Ghaluwal	10. Kharyalta	10. Chalola
11. Duhal Bangwalan	11. Kailash Nagar	11. Haroli	11. Lathaini	11. Dhamandri
12. Jabehar	12. Marwari	12. Halera Bilan	12. Muchhali	12. Dhatwara
13. Jawar	13 Nangal Jarialan	13. Hiranagar	13. Malangad	13. Dehlan Lower)
14. Jwal	14. Ram Nagar	14. Hiran	14. Raipur	14. Dehlan (Upper)
15. Karluhi	15. Raipur	15. Khad	15. Sohari	15. Fatehpur
16. Kuthera Kherla	16. Tatehra	16. Karan Pur	16. Takoli	16. Jhamber
17.Lohara Lower		17. Kungrat	17. Thana Kalan	17. Khanpur
18. Mairi Khas		18. Panjawar	18. Tihra	18. Kotla Kalan
19. Mandholi		19 Rora		19. Kuthar Kalan
20. Nandpur		20. Saloh		20. Kuthar Khurad
21. Nari Chintpurni				21. Lal Singi
22. Shivpur				22. Lamlehra
23. Suri				23. Madanpur
24. Tiai				24. Majara
				25. Mulukpur
				26. Mehatpur
				27. Nari Una
				28. Raipur Sahoran
				29. Raisari
				30. Rampur
				31. Sunehra
				32. Udaipur
23	**16**	**20**	**18**	**32**

Source: District Health Plan, Una

Manpower in Health Institutions

District has the paucity of required manpower in its health institutions. 4 sub centres in the district are without health workers. Even most of the sub centres have only single i.e. male/female health worker. 1 PHC is without a Medical officer, 2 PHCs without HE or BEE, 12 PHCs without Staff Nurses, 15 PHCs without LTs, 14 PHCs without FHWs and 4 PHCs are without Class-IV staff. All the CHCs are without specialists. Therefore, the dire need is of health personnel, comprising of doctors, post graduate specialists, staff nurses, health educators, laboratory technicians and health workers.

Health Infrastructure

Out of total 134, only 108 sub centres in the district are located in government, 16 in private and 10 in donated or community buildings. The buildings of 52 sub centres require

major repair, 50 sub centres need water supply, 18 sub centres require electricity supply, and almost all the sub centres should be provided with labour rooms and separate toilets for clients. With regard to Primary Health Centres, 17 are housed in government buildings and 2 in rented or private buildings 2 PHCs require major repair. 2 need proper water arrangements, 11 should be provided with labour rooms, 7 need Operation Theatres and 11 PHCs should have laboratory facilities. It is a matter of concern that only 2 PHCs have vehicles and 17 are without vehicles. Almost all the CHCs have good infrastructure and health facilities with provision of water supply, electricity, labour rooms, operation theatres, toilets, laboratories and transport facility. Only one CHC is without vehicle.

Private Health Facilities

There is a large set up of private health institutions in the district. The district has more than 470 private Registered Medical Practitioners. In addition, there is number of well established nursing homes, with provision of specialist services. The detail of a few clinics is as under:

- Arya ENT Hospital, Mehatpur
- Nanda Clinic, Una
- Kanwar Clinic, Una
- Shivalik Hospital, Una
- Mehta Charitable Hospital, Kotla
- Dr Lekhi's Clinic at Daulatpur
- Surya Life Care Hospital
- A.M.C. Hospital
- Malik Hospital & Diagnostic Center, Mehatpur
- Numbers of day care clinics for medicines, pediatrics, eyes etc. are run by the specialists.

The private sector health institutions have 162 beds.

Charitable Hospital

Una district has one charitable ISM hospital located at Kotla with bed strength of 20 and the hospital is providing health services free of cost.

Ayurvedic Health Services

In Himachal Pradesh, treatment through Indian system of Medicines and Homeopathy is being provided to the general public by 2 regional Ayurvedic hospitals, 2 circle Ayurvedic hospitals, 3 tribal hospitals, 9 district Ayurvedic hospitals, 1 nature care hospital, 1109 Ayurvedic health centres, 9 ten/twenty hospitals, 3 Unani health centres, 14 homeopathic centres and 4 Amohi clinics. There are 3 Ayurvedi pharmacies in the districts of Mandi, Sirmaur and Kangra. The pharmacies are manufacturing medicines which are supplied to

the Ayurvedic health institutions of the state. One Ayurvedic college is functioning in Kangra district, the college awards Bachelor (BAMS) and Post graduate degrees in Ayurvedic. Una district has also a good network of Ayurvedic intuitions. The detail is as follow:

Table-7.6
Detail of existing Ayurvedic, Homeopathic and Nature Care Centres in the district

S. No.	Institutions	Una	Santoshgarh	Kutelelhar	Chintpurni	Gagret	Total
1	Ayurvedic Health Centres	9	13	19	16	11	68
2	Homeopathic Dispensaries	1	-	-	-	-	1
3	District Ayurvedic Hospitals	1	-	-	-	-	1
4	Ayurvedic Hospitals (10 Beds)	-	1	-	-	-	1
5	Nature Care Centre	-	-	-	-	1	1
	Total	11	14	19	16	12	72

Source: District Ayurvedic Officer, Una

The department of Indian system of medicines (Ayurvedic, Unani, Homeopathic etc.) is always associated with National Health Programmes like malaria eradication, family welfare, AIDS, immunization and pulse polio.

The department of Ayurvedic is working under the overall supervision of District Ayurvedic Officer. The staff position in the district is as follow:

S. No.	Particular	Sanctioned	Filled up	Vacant
1	District Ayurvedic Officer	1	1	-
2	Sub-divisional Ayurvedic Medical Officer	1	1	-
3	Ayurvedic Medical Officer	76	76	-
4	Ayurvedic Pharmacist	73	45	28
5	Dai	52	42	10
6	Staff Nurse	3	3	-
7	Class IV	48	26	22
	Total	254	194	60

Source: District Ayurvedic Hospital Una

District Ayurvedic Hospital Una, Ten Beds Ayurvedic Hospital (Santoshgarh) and Nature Care Centre, Oala have started panchtantra principles of Ayurvedic system for curing the diseases: Ayurvedic hospitals/health centres are providing OPD facilities to the aged patients on every Tuesday. Operation facilitites for specific diseases like piles are being provided by Ayurvedic hospitals. In addition to this, Ayurvedic Department participates in National Health Programmes and School Health Programmes.

ICDS Programme

There are 1353 Aganwari Centres in Una district with 1348 Anganwari workers and 1349 helpers. The anganwaris are performing multiple duties particularly in the area of health care, focusing on pregnant mothers, infants, children and adolescent girls. The Anganwaris

care the pre-school children and also perform nutritional services in favour of children. The nutritional feed is distributed under the overall supervision of the gram panchayat. The administrative network of the department has 1 District Project Officer (DPO) 5 Child Development Project Officers (CDPOs) posted at block headquarters and 23 Supervisiors (against the required posts of 59) posted at block headquarters.

7.3 Power Sector

Himachal Pradesh State Electricity Board (HPSEB), Operation Circle, Una is feeding power supply to 2800 tubewells situated in different villages falling under the jurisdiction of Electrical Divisions of Una, Amb and Gagret. In order to properly irrigate the cultivable land as well as for the supply of drinking water, the farmers are very much keen to increase more area under irrigation, they do not want to depend on rains and they are always ready and want to adopt alternative sources of regular supply of water for irrigation and drinking purposes.

The villages under the jurisdiction of Operation Circle, Una have a large population (almost 80 per cent of the district) and also agricultural land, which can be irrigated by installing electric tube wells. A total number of 1101 tubewell connections have already been given under Supply of Power (SoP) scheme in Una Operational Circle. In addition, 60 tubewells are being run either by using diesel generators or by using tractors. Actually the diesel operated tube wells are very costly, only the rich farmers can afford the cost of the diesel generators or tractors. The poor farm households are not in a position to run these tubewells. There is a dire need to convert these tubewells to electric ones under the SOP scheme.

Therefore, to provide supply of power to existing diesel operated tubewells and for another 1101 electric tubewells to be installed in 119 villages, a Scheme, "SPA: PE scheme for Release of Tubewells connections has been framed. The provision of DTRs, HT line and LT lines have been made as per existing and expecting tubewell connections and accordingly LT lines has been proposed with different sizes of conductors. The voltage regulation will be ensured to remain within permissible limits after the release of tubewells connections. The estimated cost of the project is Rs 734.967 lakhs. The funds will be provided by Rural Electrification Corporation under SPA: PE category. The time period for implementation of the scheme is 2 years. The block wise detail of villages in the project area is as follows:

Table-7.7
Block wise details of villages to be covered under SPA-PE Scheme

Sr. No	Block	Electric divisions wise no. of villages			
		Amb	Gagret	Una	Total
1	Gagret	7	25	0	33
2	Amb	11	0	0	11
3	Haroli	0	46	0	46
4	Una	0	0	18	18
5	Dhundla	0	0	11	11
6	Total Villages	18	72	29	119
7	No. of agri connections	237	646	218	1101
8	Cost per pumping set	Rs 66800			

7.4 District Rural Development Agency (DRDA) Una

DRDA is implementing the rural development and poverty alleviation programmes in the district. The administrative structure of the department is operated from the district-block-village. It has its main office in Una and block level offices at Una, Bangana, Amb, Gagret and Haroli. The Project Officer DRDA is the overall incharge and is assisted by Assistant Project Officer and other supporting staff. The total sanctioned posts in the department are 21, out of which 2 are vacant.

The following schemes are being operated by DRDA in the district;

(i) Centrally Sponsored Schemes: SGSY, IAY, SGRY, DPAP Haryali and NREGS

(ii) State Sponsored Schemes: RGAY, NFBS, GRDCA

The DRDA operates the schemes in coordination with Panchayati Raj Institutions (PRIs) and the PRIs oversee the working of schemes. For example among the total beneficiaries of SGSY scheme in the district, the percentage of SCs and women are 25 and 65 respectively. This scheme has created new avenues of self employment to the BPL families. Individual as well as Self Help Groups beneficiaries of this scheme are getting employment through the scheme. Although the beneficiaries are complaining of the higher interest rates on credit, provided under the scheme, but in totality the scheme is beneficial as it is generating employment and upgrading the skills.

Micro Credit and Role of SHGs

The basic objective of Self Help Groups (SHGs) mechanism is to involve supplementary credit strategies for meeting the credit needs of the poor by combining the flexibility, sensitivity and responsiveness of the informal credit system with the strength of technical and administrative capabilities and financial resources of the formal financial institutions. It facilitates to encourage banking, savings and credit habits in those segments of rural population where the formal financial institutions usually find difficult to reach/serve. Credit needs of the rural poor are characterized by absence of any clear distinction between production and consumption requirements. The needs are small but often arise at unpredictable times and are usually of a marginal nature. Meeting these credit needs as

and when they arise is crucial, if perpetual dependence on an informal credit agent is to be reduced. Against this background an alternate mechanism for meeting the credit needs of the rural poor in the form of SHGs was evolved. SHGs initially conceived as thrift groups to mobilize savings and meet credit needs of rural poor with a view to end their dependence on money lenders, have, over the years, developed as the strongest tool to not only fight poverty but also tackle delicate socio-economic issues and find sustainable solutions thereof. Due to this, micro-credit has come to stay as an integral part of every strategy planned for rural development.

As the CDPOs are the main players in the formation of SHGs in the district, therefore, the CDPOs through their supervisors/anganwari workers are playing an important role in nurturing the SHGs to achieve the credit linkages with banks. In the present scenario, the district programme officer is required guiding the CDPOs/Supervisors to encourage the already formed SHGs to approach banks for credit linkages. Only a few banks have given branchwise targets for SHG formation and linkages to its branches, other banks are not showing much interest. Although, maintaining the progress of the SHGs has already been included in the structured agenda of the DCC/SC/BLBC meetings, however, the information feedback from banks is not regular and the data reported by the CDPOs is relied upon. Therefore there is need to train bankers, other agencies and also groups regarding the functioning of the SHGs. The training should be imparted under the overall guidance of NABARD. The involvement of the NGOs is also necessary for the successful linkages of these programmes. All the bank branches should also be motivated to involve in the formation of groups and their credit linkages with banks.

There are almost 35,000 Self Help Groups (SHGs) operative in state, promoted by the Department of Social Justice and Empowerment and different NGOs. The number of credit linked SHGs in the state was 29000 during 2006-07, covering 16,586 villages. A total of 986 bank branches were associated with micro credit. District Una has during. All the SHGs are saving linked and only (CDPOs +NGOs) are credit linked.

Non Government Organizations (NGOs): Una has a number of NGOs, only also few of them are engaged in formation of SHGs. In addition to the formation of SHGs, there is a need to impart training and education to the members about the newskills, innovative techniques and marketing of goods, prepared by SHGs.

7.5 Road Network

As per the policy of the Government of India, all the villages are ultimately to be connected with all weather roads in a phased manner. As per master plan prepared for the state, Himachal Pradesh needs 39,045 kms roads to connect all villages. After completing connectivity to all the villages the density of roads in the state would be 70.13 kms per 100

squ kms of area and Una would have 114.29 kms. In 2004-05, the roads length in the state and Una district was 24922 kms and 1453 kms respectively. The density of roads was 43.09 kms in state and 92.34 kms in Una against 100 squ. kms of area. The road length in 2006-07 increased to 30,264 kms in the state and 1785 (1602) kms in Una.

Status of Road Network in Una District

Sr. No.	Particulars	Una	Bharwain	Bagana	Total
1.	Total length of roads (a) State highway (b) Other roads	538.226 29.700 508.526	666.403 50.005 616.398	398.154 41.00 357.154	1602.783 120.705 1482.078
2.	List of villages which have no road link	Nil	45	59	104
3.	List of roads approved for up gradation during 2008-09	3	-	3	6
4.	List of road approved for repair/maintenance during 2008-09	12	-	26	38
5.	List of new road constructed and repaired roads	-	-	PMGSY NABARD 11+2=13 3+3=6	19
6.	List of needed Bus shelters	-	-	3	3
7.	Problems (a) Obstacles created by people in construction (b) Non availability of encumbrance free land				
8.	Suggestion: educate people about the importance of roads				

Table-7.8
Villages without Link roads

S. No.	Bharwain Division		Bangana Division	
	Name of village	Name of village	Name of village	Name of village
1.	Hatwal	39. Uppar Behar Jaswan	1. Tanda Jhikla	39. Madhan
2.	Naruli	40. Nakki	2. Tanda Uparla	40. Kholi
3.	Gairu	41. Saluri	3. Sakohan	41. Chulehri
4.	Tundkhari	42. Mandholi	4. Ludher	42. Lidkot
5.	Kuthera	43. Suheu	5. Mowkhas	43. Bohroo
6.	Haryala	44. Gir Gir	6. Kuhroo	44. Chukath
7.	Kuthera Rampur	45. Beomal	7. Chakroa	45. Bahal Khalsa
8.	Bhatiawala		8. Kukhera Rajputan	46. Kamoun
9.	Amb		9. Kukhera Jattan	47. Jagat Khana
10.	Kharyali		10. Dhatol	48. Kharian
11.	Paplehra		11. Kaswan Raniutan	49. Chaploh Gardan
12.	Amokla Pritan		12. Bhugarian Chamiaran	50. Raunkhar
13.	Amokla Sandha		13. Bhugarian Brahmina	51. Laishan
14.	Bam Bansera		14. Beri	52. Behi
15.	Gugwer		15. Bahal	53. Baslehar
16.	Badhmano		16. Tareta	54. Behlan
17.	Bhatehar Jhikli		17. Karsai	55. Degrah
18.	Bhatehar Parli		18. Khelwin	56. Baruha
19.	Malour Awarla		19. Rayli Baniala	57. Ram Nagar
20.	Sarda		20. Sohari	58. Panjora
21.	Andoh		21. Turkal Uperli	59. Hahri Devi Singh
22.	Wand Bakshi		22. Turkal	
23.	Bhatolan Padhar		23. Budhan Jhikla	
24.	Rajpur Jaswan		24. Bhawara	
25.	Nari		25. Padyola	
26.	Dulehar		26. Bushal	
27.	Larillar da Thapal		27. Rachhol	
28.	Gawalsor		28. Jharkhar	
29.	Parah		29. Chhaproh Khurd	
30.	Naloh		30. Bhadwar	
31.	Sanoh		31. Gulehar	
32.	Talahar		32. Barol	
33.	Repoh Muchhlian Deur		33. Patti	
34.	Sar		34. Doh	
35.	Khawari Pattian		35. Changreri	
36.	Dhar Gujra		36. Uancli	
37.	Baroh		37. Dobar	
38.	Ghugrala		38. Sasan	

Source: Department of Public Works, Himachal Pradesh

7.6 Poverty Reduction Strategy

Though, the poverty reduction programmes implemented in the past have successfully brought down the number of poor in the country, yet more than one fourth of India's population continues to live below poverty line even after sixty years of its independence.

Table-7.9
Percentage of population living Below Poverty Line in Himachal Pradesh and India (2004-05)

Year	All India			Himachal Pradesh		
	Rural	Urban	Combined	Rural	Urban	Combined
1973	56.4	49.0	54.8	27.4	13.2	26.4
1983	45.6	40.8	44.5	17.0	9.4	16.4
1993	37.3	32.4	35.9	30.3	9.2	28.4
2004	28.3	25.7	27.5	10.7	3.4	10.0

Source: Various National Sample Survey (NSS) Rounds (27^{th} 38^{th},50^{th} & 61th)

Table-7.10
Percentage of population living Below Poverty Line by social groups in Himachal Pradesh and India (2004-05)

	Rural			Urban		
	SCs	STs	OBCs	SCs	STs	OBCs
Himachal Pradesh	19.6	14.9	9.1	5.6	2.4	10.1
India	36.8	47.3	26.7	39.9	33.3	31.4

Source: National Sample Survey (61th Round)

Table-7.11
Detail of Survey on Rural Poor Families in Himachal Pradesh

District	BPL Survey 1998-99		BPL Survey 2002-07	
	No. of BPL families	% of families Living BPL	No. of families	% of families Living BPL
Una	15439	19.1	15191	16.9
Himachal Pradesh	286447	27.6	282370	23.9

Source: Department of Rural Development of Himachal Pradesh

Incidence of chronic and multi dimensional poverty can be addressed through a comprehensive strategy approach focusing on those programmes which are providing immediate measures to mitigate the incidence of poverty and ensure the flow of sustainable income to the poor. It is possible if more stress is given on the programmes which are providing wage employment for a good period of the year. The NREGS is the programme, which not only provides income transfer to the poor but also creates durable assets and strengthens the livelihood resource base of the poor. Another programme, the SGSY aims to bring the poor above BPL through self employment. Simultaneously, it mobilizes the social groups through Self Help Groups, which help them for income generating assets and build capacity of the beneficiaries for sustaining the flow of income in long run.

Employment

Expansion of employment oppurtunitieas has been an important objective of development planning, not only to cover the backlog of unemployment but also to provide gainful employment to the additions to the labour force. The total unemployment position of the

state for the year 2009 is projected as 5.9 lakh persons. So far as the Una district is concerned, the unemployment situation was 55,621 persons in 2007-08.

Table-7.12
Unenmployment Status in Una

Year	No. of Employment Exchanges	Registered Applicants	No of Applicants in running registers	Post Graduates	Graduates	Matric & Senior Secondary	Other Educated	Illiterates
2002-03	2	8755	57839	2208 (3.8)	6880 (11.9)	42888 (74.2)	5695 (9.8)	168 (0.3)
2003-04	2	9319	60363	2860 (4.7)	7725 (12.8)	43967 (72.8)	5595 (9.3)	216 (0.4)
2004-05	2	10144	61606	3192 (5.2)	8582 (13.9)	43747 (71.0)	5907 (9.6)	178 (0.3)
2005-06	2	10782	64866	3592 (5.5)	9853 (18.2)	44800 (69.1)	6405 (9.9)	216 (0.3)
2006-07	2	12045	57605	3924 (6.8)	9706 (16.8)	37072 (64.4)	6679 (11.6)	224 (0.4)
2007-08	2	11788	55621	4079 (7.3)	9296 (16.7)	35664 (64.1)	6356 (11.4)	226 (0.4)

Source: Department of Employment Una

Keeping in view the unemployment situation in the district, the district should implement these employment generating programmes, which are envisaged in the state development policy approach and aim at increasing productive employment in different sectors of economy. As agriculture has the potential to generate vast employment and self employment avenues for educated unemployeds, therefore the state government has launched (January 2009) a new scheme "Pandit Deen Dayal Kisan Baagwan Samridhi Yojna" in the state to introduce innovative technology. Under this scheme a sum of Rs 353 crore has been earmarked through which the government would subsidized up to 80 per cent of the total investment made, in setting up poly houses, installing drip and sprinkler irrigation system.

Role of SHGs as informal credit delivery system

The basic objective of Self Help Groups (SHGs) mechanism is to involve supplementary credit strategies for meeting the credit needs of the poor by combining the flexibility, sensitivity and responsiveness of the informal credit system with the strength of technical and administrative capabilities and financial resources of the formal financial institutions. It facilitates to encourage banking, savings and credit habits in those segments of rural population where the formal financial institutions usually find difficult to reach/serve. Credit needs of the rural poor are characterized by absence of any clear distinction between production and consumption requirements. The needs are small but often arise at unpredictable times and are usually of a marginal nature. Meeting these credit needs as and when they arise is crucial, if perpetual dependence on an informal credit agent is to be reduced. Against this background an alternate mechanism for meeting the credit needs of the rural poor in the form of SHGs was evolved. SHGs initially conceived as thrift groups to mobilize savings and meet credit needs of rural poor with a view to end their

dependence on money lenders, have, over the years, developed as the strongest tool to not only fight poverty but also tackle delicate socio-economic issues and find sustainable solutions thereof. Due to this, micro-credit has come to stay as an integral part of every strategy planned for rural development.

Farmers' club

The concept of the Kisan Clubs is more relevant today not only to inculcate strong banking ethos but also to provide access to market information, dissemination of better cost effective cultural practices, avenues in other sectors, soil testing, water testing, expert advice on various matters concerning agriculture and rural life etc. The Farmers Club in the district has been used effectively for propagating concept of modern farming. However, the functioning of some of the Farmers Club is not upto the mark. Therefore, the concerned banks and club coordinators need to involve themselves more closely with functioning of the clubs. Banks can benefit by utilizing services of the clubs to promote their business and achieve the desired growth in agricultural credit as mandated by GoI.

Table-7.13
List of farmers groups and organization working in Una district

Sr. No.	Name and location of farmers & F. Organization	Adress	Area of operation	Commodity Enterprise	Theme under which groups organized	Activity performed
1.	Himoutkarsh Una	c/o Kunwar Hari Singh Main Bazar, Una	Area of operation	Education & social activities	Social welfare	Social services
2.	Swantar Kissan Morcha	c/o Thakur Sita Ram VPO Thathal, Tehsil Amb District Una	Entire District and even outside the district	Agriculture, Horticulture & Animal Husbandry	NABARD	Extension Activities
3.	Zila Kissan Sangh	c/o Bishan Swroop Angiras VPO Badehar District Una	Entire district	Agriculture, Horticulture & Animal Husbandry	NABARD	Extension Activities
4.	Women in Agriculture Groups	c/o Subject matter specialist (Agri) of concerned Block	8 groups per block	Agriculture	Credit & thrift activities in the group	Extension activities and exposure visits
5.	Nehru Yuvak Kendra	c/o Coordinator Nehru Yuvak Kendra	Entire district	Agriculture, Horticulture, Animal Husbandry & Social Service	NABARD	Extension activities and exposure visits
6.	Rotary Club	Chairman of the concerned club VPO	Una, Amb, Daulatpur, Gagret	Social Service	Social Welfare	Social services 7 extension activities
7.	Environment & Energy Group	Nari (Dera Baba Rudru) District Una	Entire district	Agriculture, Horticulture, Animal Husbandry & Social Service	NABARD	Social services 7 extension activities

Source: ATMA Report, Una

Una district has a number of farmer organizations doing an excellent job in the areas of extension activities and social services. The need is to expand their activities whole of the district to promote farm and non farm sectors so that the income of the rural households might be increased.

Women development Initiatives

Status of women in the district:

Development if not engendered is fatally endangered (Human Development Report, 1995). It means development till date is not sex neutral. It is biased against the fair context of gender inequality and other issues concerning women which can be corrected only by involving more women in decision making process. The data as per table show that Una has 49.96 per cent women in the total population of the district.

Table-7.14
Status of women population in the district (Census 2001)

Tehsil/Sub-tehsil	Rural population			Urban population			Total Population		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Amb	67850	69260	137110	3150	3385	6537	71000	72645	143645
Bangana	31732	32615	64347	-	-	-	31732	32615	64347
Una	66753	65137	131890	17415	15474	32889	84168	80611	245390
Haroli	29335	29844	59179	-	-	-	29335	29844	59179
Bharwai	8054	8269	16323	-	-	-	8054	8269	16323
Total	**2037724**	**205125**	**408849**	**20565**	**18859**	**39424**	**224286**	**223984**	**448273**

Source: Statistical Abstract of Una 2007-08

As may be observed, Literacy Rate amongst women, both rural and urban is markedly lower than their male counterparts in the district. Literacy rate in the district Una as per following table:

Table 7.15
Status of Literacy in Una district (Census 2001)

Parameter	Male	Female	Total
Rural	75.0	64.0	69.4
Urban	75.5	63.1	72.0
Total	75.0	64.3	69.7

Source: Statistical Abstract of Una 2007-08

In addition to literacy rate among women, the sex ratio in the district is 997 as compared to 968 for the state as a whole. Whereas the number of female have declined in the state from 975 (1991 census) to 968 (2001 census), the fall is more prominent in the district where this number has gone down from 1006 to 997, showing a clear sex bias in favour of the male child. Resultantly, the numbers of Female Foeticide cases have also gone up clear violation of the PNDT Act.

Income generating opportunities for women

Traditionally, the involvement of women in income-generating activities other than wage employment and farming in the district is almost negligible owing to various socio-cultural factors. The NABARD has taken initiatives under NFS promotional schemes/DRIP and conducted REDPs for women for income generating activities based on modern skills. The department of Women and Child Development through CDPO offices is facilitated in the formation of Self Help Groups. CDPOs have formed a number

of groups in the district and opened saving accounts, which are mature enough for credit linking by banks. The recent launching of NREGS will provide a considerable wage employment to women.

Potential activities for women

The potential activities for women in the district include stitching, tailoring, embroidery, garment manufacturing, quilting, fabric painting, leather goods manufacturing, computer centres, tution centres, schools, kindergartens, retail business, food processing, beauty culture etc.

Credit package for women

A sum of Rs. 1.26 crore, as per district credit plan 2007-08, has been disbursed in the district. Under this sub-plan 362 women beneficiaries have got benefits from the banks sector. The progress in credit disbursement is regularly reviewed in the DCC meetings on quarterly basis. The progress in linkage of SHGs is now considered satisfactory as 34 SJGRY/DWCUA (SHGs) have been got loans of Rs 22.8 lakh to supplement groups resources in their inter-loaning endeavor amongst the members. No bank has established any Women Development Cell (WDC) to cater the requirements of women in the district so far.

Suggested Action Points

- More empathy towards issues related to women empowerment
- Due importance for Credit Linking of women SHGs of rural poor
- The district lead bank may examine possibility of setting up of Women Development Centre in the bank
- Subsidy linked programmes of various government departments to focus on development of women
- Need to promote better performing NGOs in the district to tackle women centric issues.

Other Initiatives

DRDA plays a catalyst role in the formation of SHGs belonging to Below Poverty Line (BPL) category for their nurturing, providing revolving funds, preparing rating models and ultimately assisting these groups to take up economic activities with bank's credit under the SGSY schemes.

Women Development Corporation

The Himachal Pradesh government established the state Women Development Corporation and its district office started functioning in Una in 1990-91. The corporation advances loans in conjunction with nationalized banks to take up income generation

economic activities. Loans are advanced only to state residents. The interest rates are between 4 to 5 per cent annually.

Women Welfare

Various schemes are being implemented for the welfare of women in Himachal Pradesh. The major schemes are as under:-

- **State Homes**: The main purpose of the scheme is to provide shelter, food, clothing, education and vocational training to young girls, widows, deserted, destitutes and women who are in moral danger. For the rehabilitation of such women after leaving State Homes, the financial assistance upto Rs. 10,000 per person is also being provided. A budget provision of Rs. 3.00 lakh was kept under this scheme during 2007-08.
- **Mukhya Mantri Kanyadaan Yojna**: Under this programme marriage the grant has been increased to Rs. 11,001 from Rs. 5,100. It is being given to the guardians of the destitute girls for their marriages provided that their annual income does not exceed Rs. 7,500. During 2007-08, a budget provision of Rs. 140.00 lakh was kept for this purpose, out of which an amount of Rs. 71.00 lakh was spent and 751 beneficiaries were covered.
- **Self Employment Scheme for Women**: Under this scheme, Rs. 2500 are given to the women, whose annual income is less than Rs. 7500, for carrying income generating activities. During 2007-08, a budget provision of Rs. 13.00 lakh was made.
- **Widow Re-marriage Scheme**: From the year 2004-05, the State Govt. has started widow re-marriage scheme. The main objective of the scheme is to help in rehabilitation of widow after re-marriage. Under this scheme an amount of Rs. 25,00 as grant, is provided to the couple. During 2007-08, a budget provision of Rs. 35.00 lakh was kept under this scheme, against which Rs. 8.00 lakh was given to 32 such couples upto December, 2007.
- **Swayamsidha Scheme**: For the economic and social empowerment of women, a Centrally Sponsored Scheme 'Swayamsidha' is being implemented in eight blocks viz. Rohru, Baijnath, Chamba, Solan, Pachhad, Jhanduta, Lambagaon and Karsog by the department. Under this scheme so far 800 women Self Help Groups have been formed in these blocks. The members of SGHs formed under this scheme, have saved an amount of Rs. 160.85 lakh so far.
- **Mother Teressa Asahay Matri Sambal Yojna**: The aim of this scheme is to provide assistance of Rs. 1,000 per child to the destitute women belonging to the BPL families or having annual income less than Rs. 11,000 for the maintenance of their children. The assistance is provided only for two children.

Child Development

Integrated Child Development Services

Under "Integrated Child Development Services" (ICDS) programme, which is 100% Centrally Sponsored Scheme/Programme, for the overall development of children between the age of 0-6 years, pregnant/nursing mothers and adolescent girls, the department is providing supplementary nutrition, pre-school education, health check-ups and referred services through 18,248 Anganwari canters in 76 projects in the State. Out of 18,248 Anganwari centers in Himachal Pradesh, 10,894 centers have been made functional during the current financial year. During the financial year 2007-08 about 4, 28,172 children, 1, 01,703 pregnant girls are being benefited under this scheme. There is a budget provision of Rs. 6,099.80 lakh for the year 2007-08, out of which an amount of Rs. 2,496.90 lakh has been upto December, 2007.

Balika Samridhi Yojna

Main objective of the scheme is to change the negative attitude towards the girl child and mother at the time of birth in case of the girl child. Under this scheme, there is a provision to give post birth grant of Rs.500 in favor of first two girl children taking birth in the BPL family. Besides scholarship ranging from Rs. 300 to Rs. 1,000 per girl student per annum upto 10^{th} standard is also given to those girls who took on or after 15.08.1997. During 2007, post birth grant of Rs. 11.57 lakh was given in favour of 2,314 girl children and a scholarship of Rs. 6.00 lakh was given to 1,839 girls.

Kishore Shakti Yojna

This is 100% Centrally Sponsered Scheme and is being implemented the state through ICDS network. Under this scheme about 3, 56,000 adolescent girls between the age group of 11-18 years have been identified and every year, Rs. 83.10 lakh @ Rs. 1.10 lakh per block are kept under this scheme. In addition, Nutrition and Health Education has been provided to 74,000 Adolescent Girls. During 2007 an amount of Rs. 75.00 lakh was spent under scheme.

Welfare of Disabled

For the welfare of handicapped the following schemes are run by the department:

- **Disabled Scholarship**: The main purpose of this scheme is to encourage handicapped children for education. Scholarships are given to them under this scheme. During 2007-08, Rs.49.60 lakh were kept for this scheme and Rs. 10.65 lakh were spent upto December, 2007, benefiting 498 handicapped children.
- **Marriage Grant for Disableds**: Marriage grant @ Rs. 5,000 is given to those who marry disabled girl or boy having not less than 40 percent disability and who have attained the age of 21/18 years respectively. During 2007-08, an amount of Rs. 30.00 lakh had been kept for that purpose and an amount of Rs. 10.88 lakh was

spent, benefiting 173 persons upto December, 2007. The amount of assistance of Rs. 5,000 has been increased to Rs. 8,000 to those having disability upto 74 per cent and Rs.15, 000 to those having disability more than 74 per cent.

- **Self Employment Scheme for Disabled**: Under this scheme, Rs. 2500 are provided to the disabled persons whose disability is 40 per cent or more and annual income is less than Rs. 7500. There was a budget provision of Rs. 10.00 lakh for the year 2007-08 under this scheme and Rs. 1.15 lakh was spent upto December, 2007, benefiting 46 persons.

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Agriculture and Allied Sectors: Some Success Stories

1. Adopting diversification and subsidiary occupations in agriculture, **Shri Baljit Singh s/o Shri Ranjit Singh** of Village and Gram Panchayat Panjawar, Teh Haroli, has fetched a glorious success. Earlier he was engaged in traditional farming and earning very less. Later on, he came into contact with the departments of agriculture, animal husbandry and fishery. Subsequently he started agriculture purely on modern techniques. He visited Germany to get information about the advanced techniques and equipments, to be used in agricultural, pig and poultry farms. After coming back, he started three new ventures; (i) Fish farm (ii) Pig farm and (iii) poultry farm and got required knowledge, information and cooperation from the concerned government departments. The detail of his ventures is as follows;

- Fish Farm: the total area under fish farm is 280 kanal, from where he is getting 70 MTs fish annually. He spends an amount of Rs 7 lakh annually on fish seed.
- Poultry Farm: He has a backyard poultry with 100 birds
- Pig Farm: It is the first pig farm in Himachal Pradesh and the largest one in Una district. He produces 40 MTs of pigs annually and earns countable income.

He is very happy with his new ventures and known as a successful farmer, not only in Una but in the state. In addition he is doing agriculture very successfully.

2. **Janab Rafiq Mohammad s/o Janab Barkat Ali** is a permanent resident of village Kuthera Khairla, Tehsil Amb. He has set an example for others by starting sericulture. He is thankful to the department of sericulture who provided him education, training and financial help to start this activity. He has installed 35 iron beds in 7 rooms where silk worms are kept for silk production. He is growing Mulberry saplings/ plants in 20 kanal area. The silk seed/worms are supplied by the department, located at Dhabri Takrala, which are transported from Bangalore. Almost one quintal fresh mulberry leaves are consumed by the silk worms, putting in 35 iron beds. He is getting 30 kg silk cocoons per bed for a season of six month. He sells his silk cocoons to Bangalore and Dehra traders. Shri Rafiq Mohammd is a successful sericulture farmer.

3. A resident of village Dangoh, block Gagret, tehsil Amb, and **Shri Sushil Kalia s/o Shri Vinod Kumar** is an educated and progressive farmer, very much popular among the farmers of this area because of his success in the field of farming. Although, he was eligible for a government job or for a good job in private sector, yet he preferred farming because of his great determination and confidence to adopt this enterprise in a successful manner. He took a lead and initiated the occupation of farming, based on new technology.

In addition to his own land of 70 kanal, he is leasing in 10 kanal land to cultivate maize in kharif and wheat in rabi. By adopting new techniques, certified seeds, IPM and INM practices, he is getting high yield and supplying his seed to other farmers. He is not happy with the existing marketing infrastructure in the district.

4. **Shri Ramesh Chand Prashar s/o Shri Rulia Ram** of village and gram panchayat Nakroh, block Gagret, Teh Amb is retired Col. of army. After his retirement in 1999, he adopted agriculture as his main occupation. He is producing sugarcane, basmati rice, mustard (sarson), turmeric (haldi), wheat and maize in 60 kanal owned land, irrigated by government tubewell. He has his own tractor and other agricultural machinery. As per the suggestions and guidelines of agriculture department, he is using recommended agriculture practices and getting better quality and quantity of his agricultural produce. He is mostly using Farm Yard Manure (FYM).

5. **Shri Baldev Raj Sharma s/o Bharan Das Sharma** of Village Jalwal, Gram Panchayat Kuthyari, tehsil & block Amb is cultivating 150 kanals of land. The total cultivated land is irrigated. He is growing wheat, maize, paddy and vegetables. He is using high yielding variety seeds and purchasing seeds from the sale points of agricultural department. Besides agriculture, he has a well managed dairy farm having 15 cows and buffaloes, and selling 50 litres milk daily. His dairy farm gives him cow dung/manure in large quantity which is used as farm manure. As a result, per acre consumption of chemical fertilizers is comparatively less for crop sector. His agriculture farm is totally mechanized, having facilities of tractor, rotavator and thresher. Per acre productivity of all the major crops is high in his farm if it is compared with other farmers. No doubt, Shri Baldev Sharma is a progressive farmer and doing agriculture on a large sized farm, but he is not very happy with present status of agriculture, not only in Una or Himachal Pradesh but all over the India. He has the views that input prices are very high but the prices of crop produce are meager. He is one of the progressive farmers of the district and also Pardhan of his gram panchayat.

6. **Thakur Sita Ram s/o Thakur Babu Ram** (Chairman of National Freedom Farmer's Group) of Village & Gram Panchayat Thathal, tehsil Amb, has 200 kanal irrigated land. Farming has been an ancestral occupation for his family. Earlier, the family was doing traditional farming, but later on he started the cultivation of medicinal plants. In the beginning he faced some problems, but after some time he succeeded to over come the problems. Presently, he is growing medicinal plants successfully. He is cultivating a variety of these plants which include, Piplee, vankasa, gudmar, sarpgandha, sarpankha, kalmej, mulathi, karkara, neelkanthi, brahmi buti, isabgol, gumma, malkangani, chaneta, gokru, talhaadi, kakjunga, tulsi (5 types), chetra, heeng, coconut, supari, rudraksh, laung, jaifal, dalchini, kaali irch, gulaab jamun, khirni, kaju, chandan (white and red), chaura, tea,

cofe, har singar, badi ilaichi, choti ilaichi, karmas, muskapoor. Besides, medicinal plants, he is also growing wheat, maize, rice and other crops, the per acre productivity of all the crops is satisfactory.

He has also an orchard in which different varieties of mangoes, oranges, mausamis, lemons, maltas, litchis, plums, walnut, badam, peanuts, galgal, guava, grapes, kathal, apple, jhijun, banana (all types), amla, harhar, japani fruits are planted. The facility of modern agriculture machinery is available at his farm. He is unhappy with the role performed by the department of agriculture in the agriculture development process. He suggested that the irrigation facilities should be expanded and more cultivated area be provided irrigation, by installing more tubewells, lift irrigation schemes, water tanks etc. He is not only successful in the crop and horticulture sub sectors, but also much more successful for the promotion of medicinal and aromatic plants cultivation.

7. **Shri Girdhari Lal s/o Shri Brij Lal** of village Panjal, Gram Panchayat lathiani, block and tehsil Bangana is producing medicinal plants (Musli & Stevia), wheat and maize crops by using latest production techniques in his own farm of 88 kanals. He is getting facility of irrigation from lift irrigation scheme Nalaha, using 1.5 km long pipe. He purchases seeds from the agriculture department and private seed centers. Shri Girdhari Lal has also established his own vermin-compost plant. The traders themselves approach him to purchase his medicinal produce. Despite of this, he is facing problems in the marketing of agriculture crops. According to him, Bangana is 35 km away from Una and is without the facility of grains and vegetables market. As this block is a hilly block, therefore, the dire need is to solve the problem of the marketing of surplus marketable produce. If it is solved, then area under different crops will automatically increase.

8. **Shri Ramesh Singh s/o Shri Bhagat Ram,** Village & Gram Panchayat Fatehpur, tehsil Una is a successful vegetables grower. He along with his family has been growing vegetables from the last fifteen years. He has own land of 80 kanals and also leasing in 110 kanals, thus his total cultivable land is 190 kanals. He registered himself as producer cum supplier of wheat seed to the government and farmers in 1975, since then he is supplying the certified seed. He has tractor and other implements including four tubewells. His total land is irrigated. He is not satisfied with the performance of agriculture and horticulture departments as these departments do not show much interest in timely supply of quality seeds. In addition to cereals, he is also growing Tomoto, Kheera and Cauliflower as vegetables. As the vegetables prices in the local Una market are very low and uncertain, therefore, he sells most of his produce in Amritsar, Ferozepur, and Bathinda and Ludhiana markets in Punjab. The other farmers of this area usually visit his farm to get technical knowledge about the new practices adopted by him. Shri Ramesh Singh claims that he earns between Rs. 50,000 Rs. 1, 00,000 per acre from the vegetables. Over

the period of time, he triess to replace the less paying traditional crops likes maize and wheat with high value vegetable crops to increase his farm income.

9. **Shri Tarsem Singh s/o Shri Mangal Singh** of Village and Gram Panchayat, Satsun, block, tehsil and district Una has set an example in the field of diversification in agriculture with vegetables (bitterguard, cucumber, tomato, bottle guard and cauliflower which he started in 1995. He, along with his family members, is doing extensive cultivation. He has his own tractor, other implements and tubewell. He owns 50 kanal lands, out of which a small area of 5 to 7 kanals is used for wheat-maize crops, grown for home consumption. He purchases the vegetables seed from private dealers. The main reason behind his success is selling of produce by himself in the local as well as in the distant markets of Ludhiana, Amritsar, Nangal at the competitive market rates. All the members of his family work hardly on the farm and each one of them perparms the responsibility allotted to them. He is using FYM in large quantity. According to him, in case of natural calamities, the small and marginal farmers are unable to get the compensation from the government as the rich farmers succeed to get the compensation due to their links with the government officials.

10. **Shri Sawroop Singh s/o Shri Partap Singh** of Village and Gram Panchayat Lal Singi, block, tehsil and district Una is growing vegetables and other agricultural crops in his 350 kanals (100 kanals own + 250 kanal leased in). In addition he has 15 kanals of banjar land which is used for growing fodder. He has 7 tubewells, 2 tractors and all necessary agricultural implements. He purchases vegetables and crops seeds from agriculture and horticulture department's sale points and also from private seed centers. He is growing vegetables in 200 kanals and other agricultural crops i.e. wheat and maize in 150 kanals. The main vegetables, grown by him, are Cauliflower, Turnip, Radish and Potato and these are sold in distant markets of Punjab. His large sized family participates in all the agricultural and allied activities. He is very much worried about inadequate marketing facilities in the district. He has participated in a number of training programmes, organized for the development of crop and vegetable sectors. After attending the training camps, he tries his best to apply the acquired knowledge in his own fields while growing vegetable and cereal crops.

11. **Shri Krishan Gopal Prashar** of Village and Gram Panchayat Nakroh, block Gagret, tehsil Amb has 50 kanal irrigated lands. He has installed his own tubewell. He is growing wheat, mustard, gram, maize, paddy, soyabeen, lintil, moong and mash in his land. He registered himself as a seed grower in 2004. He has his own vermi-compost and herbal compost units. That is the reason that his agricultural produce is totally organic. Due to its organic nature, the local people are always interested to purchase his produce for home consumption. Therefore he has no problem in selling of his produce. He is

getting full co-operation from the agriculture department and getting subsidized facilities, provided by the department under different developmental schemes. Being awared and enlightened about the global scenario of shrinking water resources, he is very serious about the water conservation techniques, to be practiced by the common people. He is also very much worried about the declining level of under ground water sources, deteriorating soil health and depleting natural resources. He is satisfied with his occupation and also motivating others, especially the youth to adopt modern agriculture, based on innovative techniques.